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Anna Rosenqvist
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Source Criticism on the Schedule

Teaching Critical Thinking

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ISSN 2366-7672 ISSN 2366-7680 (electronic)
Springer Texts in Education
ISBN 978-3-031-14335-9 ISBN 978-3-031-14336-6 (eBook)
https://doi.org/10.1007/978-3-031-14336-6

Translation from the Swedish language edition: "Källkritik på schemat- Det kritiska tänkandets didaktik" by Anna Rosenqvist and Stefan Ekecrantz, © Liber AB. 2019. Published by Liber AB. All Rights Reserved.
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Preface

This book is aimed at teachers who teach source criticism in various contexts. The book addresses both explicit teaching content and overarching goals related to students' critical thinking in general. There is a lot of Swedish and international literature on source criticism and critical thinking, but much less on different perspectives on how to work with this from a teacher's perspective. This book is intended to fill such a need for both practicing teachers at various levels and teacher students.

The book is divided into two separate parts that are intended to serve partly different functions. Stefan Ekecrantz has had the main responsibility for part 1. This part discusses more fundamental issues related to source criticism and critical thinking, with separate chapters on, for example, how to understand students' (and teachers') resistance to critical thinking from a psychological perspective. In addition, philosophical perspectives on normative values are discussed along with a concluding comment on further reading. Part 1 is structured as a kind of dialogue with the reader, a type of dialogue that the reader can use as inspiration for discussions with his or her own pupils or students.

Anna Rosenqvist has had the main responsibility for part 2. This part is built around concrete examples of lesson plans and practical didactic choices. It is divided into nine different areas, and a short introduction to each chapter is followed by suggestions for lesson plans from pre-school to upper secondary school. The idea is that teachers will be able to find inspiration for their own teaching and make their own adaptations to other age groups and other subjects where necessary.

Stockholm, Sweden — Stefan Ekecrantz
Stenungsund, Sweden — Anna Rosenqvist

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Introduction Part 1

1

In March 2018, 61-year-old trucker and stuntman "Mad" Mike Hughes shot himself up in a homemade rocket in the Mojave Desert.[1] Incredibly, he survived the journey 572 m into the air and, after a hard parachute landing, was able to declare that he had convinced all the pessimists who had predicted his demise. However, it was not just a general daredevil nature and rocket interest that motivated him. Hughes planned to continue to develop the rocket project so that, in time, he could get high enough to see with his own eyes whether the Earth was spherical or flat. He said he thought the most likely scenario was that it is flat as a pancake, but he was not 100 percent sure and wanted to get to the bottom of what was going on.

In the time between this book's two latest editions, Hughes sadly fell to his death when his rocket crashed in February 2020, near Barstow, California. Unfortunately, what was initially meant as a tongue-in-cheek illustration of lack of critical thinking in this text turned into a true human tragedy. But, beyond Hughes as an individual, the last couple of decades have shown a sharp uptick in beliefs in a flat Earth, which relates to this book's topic, albeit as an extreme regarding critical thinking and lack thereof.

Eratosthenes (276–194 BC) proved that the Earth was round and estimated its size with astonishing precision. He did so by comparing the angles of shadows at different distant locations, an experiment that, incidentally, a teacher can replicate quite easily with their schoolchildren today (Longhorn & Hughes, 2015). Over a millennium and a half later, Christopher Columbus chose to believe Ptolemy's (c. 90–170 AD) calculations of the circumference of the—equally round—Earth instead of Eratosthenes' calculations. Based on Ptolemy's figures, Columbus predicted that Asia should be roughly where the then-unknown continent of North

[1] Associated Press (2018), Self-taught rocket scientist blasts off into California sky, https://apnewscom/870b745abdfe41dfa3bb79b49d60f117.

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A. Rosenqvist and S. Ekecrantz, *Source Criticism on the Schedule*, Springer Texts in Education, https://doi.org/10.1007/978-3-031-14336-6_1

America turned out to be. Hence Columbus's life-long conviction that western India was where, in fact, he had arrived (Harwood, 2017).

As over 2,000 years of accumulated observations and scientific calculations are not enough for Flat Earthers today, we may need to try and understand their underlying reasoning in terms of a specific perception of critical thinking. They evidently think critically about round Earth and have subjected oceans of information about the somewhat spherical shape of the planet to some critical scrutiny and then have landed in a sceptical view. Would that be enough to claim that they have engaged in critical thinking in any meaningful sense of the concept? Most people would probably not think so. Have they subjected the same scrutiny to far less convincing information about the flatness of the Earth now being disseminated on YouTube[2] and elsewhere?

We don't know, but that is hard to imagine. Simply questioning something and believing its opposite cannot reasonably be what most of us mean by critical thinking. One of the key ideas of this book is that source criticism and critical thinking must also be understood in terms of conceptual consistency and self-criticism. Do Flat Earthers question other physical phenomena with the same degree of underlying scientific consensus? To do so would make it very impractical and difficult to live a normal life. For example, when they cross a bridge that has been built using state-of-the-art engineering combined with Newtonian physics, are they questioning that science? Do they always swim across the river rather than rely on the science behind the bridge-building? And, if they presumably always choose to swim for safety's sake, how do they view Archimedes' principle in that context? Is he to be trusted?

All of us benefit from maintaining consistency in whatever we argue for. If a person sets extremely high standards for believing something in one case and much lower standards in another case of the same kind, that inconsistency itself can be seen as a lack of critical thinking. Such source-critical consistency and inconsistency is a neglected perspective in the critical thinking literature in our view, we argue. In this work, this is at least as important from a teacher's perspective as different technical aspects of evaluation of information, perhaps even more so. If a person applies his or her critical faculties selectively—which, incidentally, seems to be something of a general human tendency (Mercier & Sperber, 2017)—then that person's actual source-critical capacity may matter less sometimes. If students and their teachers can only examine something they oppose critically, then this lack of consistency could arguably be seen as more important than further advancement in source-critical proficiency.

A well-known example of such inconsistency is the later work of the historian and known Holocaust denier David Irving. Another historian, Deborah Lipstadt, had portrayed him as a Holocaust denier, whereupon Irving sued Lipstadt and her publishers for libel (Lipstadt et al., 2006). Irving had argued, among other things,

[2] See, e.g., God's Enclosed Flat Earth Investigation—Full Documentary [HD] Parts 1–12 (2015), https://www.youtube.com/watch?v=J6CPrGHpmMs.

that Adolf Hitler himself was unaware of what we now call the Holocaust. In the trial that followed, the court found that Irving had applied his source-critical methods selectively, subjecting peripheral information to biased scrutiny and handled more central data in a completely different way. The way British defamation law works is that you don't get convicted of defamation if the claim turns out to be correct. Lipstadt was therefore acquitted, not least because several experts testified that Irving had dishonestly selected individual fragments of the available source material. The main witness for the defence was the historian and World War II specialist Richard Evans, who in a book about the trial later elaborated on this:

> Irving had manipulated and falsified the documentation, suppressing material which he knew ran against his case, in order to support an untenable conclusion which was in fact the exact opposite of what the documents indicated. (Evans, 2002, p. 108)

Irving had simply applied, or not applied, his source-critical knowledge and skills depending on when it suited his purposes. A person like Irving—who had previously published respected historical works—thus does not seem to have lacked the cognitive abilities and skills usually associated with critical thinking. Improving his critical thinking skills through educational efforts, therefore, would seem rather pointless.

Here again, we have an extreme case where a person does not seem to lack critical thinking skills and knowledge of source criticism but still goes off the rails. The two examples obviously represent extremes: a truck driver building rockets to check if the earth is flat and a Hitler defender. As a reader, one should be wary when presented with such examples. What is the purpose of these particular illustrations? A relatively common rhetorical device is guilt by association, which is a kind of *ad hominem* argument.[3] Is it implied that anyone who does not fully buy this book's definition of critical thinking is weak-minded and/or a Nazi sympathiser? Obviously not, but sometimes a principled discussion of consistency and inconsistency by taking things to their logical conclusion may be warranted, which is, by the way, a common philosophical method. Later in the book, we will also discuss critical thinking about child abuse, doomsday cults and animal cruelty for the same reasons of clarity. In a teaching situation, these kinds of overly clear illustrations can sometimes be effective in avoiding grey areas and boundary-drawing problems in a particular argument, but there may also be reason to pause and consider what this may communicate. If the aim is a free discussion and you start with references to negative extremes, you risk creating a climate where the message perceived is that there is no room for different points of view.

This book is not primarily intended to help the reader become more proficient in source criticism and critical thinking. It is an area that is already covered by a large body of literature at various levels and is also something that is often learned in disciplinary-specific studies even if it is not always called source criticism or

[3] From the Latin "to man." *Argumentum ad hominem* is an argument that focuses on the person of the opponent rather than the subject matter.

critical thinking. Instead, the idea is primarily to contribute to teachers' and student teachers' knowledge in teaching source criticism and critical thinking, i.e., how to help their own students at different levels to become critical thinkers. It is rather self-evident that it is possible to become more knowledgeable and more capable of critical thinking through formal education, although the research on this is divided on both how this is most effectively done (see e.g. Davies, 2013; Moore, 2011) and how large these potential effects are (Arum & Roksa, 2011; Huber & Kuncel, 2016; Niu et al., 2013).

Again, the perspectives discussed in this book may possibly contribute to reader's own critical thinking, but that may be seen as a positive side effect in that case. We believe that the structure of the book offers a somewhat novel approach, with an introductory part (1) on research on critical thinking and the didactics of critical thinking, followed by a part (2) with concrete advice and teaching examples. Part 1 is written as a kind of dialogue with the reader, where it is intended that the professional teacher should be able to have similar dialogues with their own students. A suggested reading instruction for you, the reader, could be to continuously think about how you yourself could lead and adapt the same kind of discussions with your own students, and what could be appropriate for just for them and the level they are at.

Perhaps the most common approach to discussing and teaching source criticism is to subject to critical scrutiny the statements of others and those that run counter to one's own beliefs. Holocaust deniers, climate sceptics, political extremists (if they represent the opposite of one's own beliefs) and others are scrutinised with the tools of source criticism. Lately, much has been written about deliberate deceptions as well, in the form of so-called fake news or other. This book takes a partly different approach. A consistent theme is that more advanced levels of critical thinking are about being able to subject even one's own beliefs to critical analysis and that teachers who are able to do this are better equipped to teach source criticism and critical thinking to pupils and students. Therefore, the first part of this book will focus in part on how to understand resistance to critical thinking, when we humans tend to ignore things that contradict our own beliefs, and what the implications of this might be from a teacher's point of view.

What is Critical Thinking?

In the literature on critical thinking, there is an almost incalculable variety of definitions of the term. Melinda Marsh lists over 200 such definitions in a large literature review (Marsh, 2013). There are, of course, great similarities between the majority of these and a common feature is usually that the term covers a great deal—too much, one might argue (Stewart, 2017). The term *critical thinking* is sometimes used to mean basically anything that is not about isolated factual knowledge and memorisation. That in itself becomes problematic. If almost all thinking can be labelled as critical thinking, there is a risk that the term becomes analytically meaningless.

One way to bring some order to things is to try to separate things that are, at least in part, about different things. One can roughly divide the literature on critical thinking into three overlapping and parallel fields, or *movements*, as Martin Davies and Ronald Barnett have called them. They divide 50 years of research on critical thinking into *the critical thinking movement*, *the criticality movement* and *the critical pedagogy movement* (Davies & Barnett, 2015a).

The critical thinking movement focuses first and foremost on "thinking," i.e. cognitive perspectives, argumentation analysis and informal logic. Very simply put, this research focuses on the individual's ability to think analytically, rationally and logically. At the same time, this tradition was quick to recognise that it was also about aptitude,i.e. to what extent a person tended to use these abilities or not. In its more extreme form, this field of research deals to some extent with things that we otherwise measure with IQ tests, college exams and the like.

The criticality movement is more about how we actually act in a given context, and does not focus so much on the individual brain. The literature on *criticality* can be seen as an expression of increased interest in a broader concept that is not only about what an individual can do or what his or her aptitude is, but more about critical thinking as a kind of attitude to life: "Educating for criticality... captures a sense of enabling students to reach a level of 'transformational critique' (i.e. to live and breathe as a critical thinker, to become an *example* of what it means to be a critical being)" (Davies & Barnett, 2015a, p. 17). The more cognitive and argumentative aspects of critical thinking contained within the *critical thinking movement* remain important but can be seen as a prerequisite for, or a subset of, what the literature on *criticality* is referring to.

The critical pedagogy movement is a bit special in this context in the sense that while it is about perspectives on critical thinking, this particular tradition does not relate much to the other two and relates more to other fields of research and theory. Critical pedagogy can be seen as a branch of critical theory, i.e. a social science and normative theory that is primarily concerned with identifying and deconstructing social norms, but also with challenging these norms from a change perspective, for example with Marxist or feminist overtones. A frontline figure in critical pedagogy is the Brazilian educator and philosopher Paulo Freire (1921–1997), who saw teaching and education as a form of exercise of power (Freire, 1970/2018). Like many other critical theorists of norms, he additionally took the step of advocating for change, which some would see as an extra-scientific, more ideological perspective and others would not. By and large, in any case, the perspective is about questioning societal norms, which clearly requires critical thinking in some form.

This work can probably be said to fall within the *criticality movement* primarily, but also within the *critical thinking movement*, in the sense that knowledge of source criticism is seen as a prerequisite for being able to approach both the outside world and one's own beliefs critically and then have this as an actual way of life. Unlike critical pedagogy, however, in this context we do not include a specific form of social criticism or a specific ideological agenda for change in the concept of critical thinking.

Thus, the concept of critical thinking in this book refers to something very close to the core of classical source criticism. In this, the very concept of criticism becomes central. Is this really so? How do we know, and with what degree of certainty? Could it be any other way? This places us well in line with Robert Ennis's (1985) now classic formulation "Critical thinking is reasonable reflective thinking that is focused on deciding what to believe or do" (p. 45), but with the addition that critical thinking is also about actually acting and living with this as a guiding principle. This does not mean, of course, that problem solving, informal logic, argument analysis and so on are unimportant, but for the purposes of this book, none of these phenomena can serve as delineators for the concept of critical thinking.

When reviewing scientific studies on students' critical thinking in more detail, one often becomes uncertain about what has actually been studied, regardless of various declared definitions. Sometimes you think you get a picture of what is meant by reading the authors' explicit explanations of what they mean by the term, but when you then look at how a particular study has actually been carried out, it becomes clear that it is a very specific delineation on which the work is based. It is then often necessary to look more closely at the empirical methods that have been used in order to build up a picture of what has actually been investigated. Most commonly today, research has been based on quantitative, standardised tests in the form of multiple-choice questions, such as the California Critical Thinking Skills Tests, the Cornell Critical Thinking Test, or the Watson–Glaser Critical Thinking Appraisal (Liu et al., 2014).

A closer look at those quantitative instruments gives a clearer picture of what it is really about in reality. In many ways, they often resemble parts of university entrance exams and to some extent many types of IQ tests, i.e., they focus on reading comprehension and cognitive abilities of a rather limited scope. This means that these types of studies primarily measure the ability to analyse a short text and be able to see individual arguments in it, identify a main point and apply informal logic, which is then demonstrated by answering one of several fixed-answer options. It is common for authors of scientific studies on critical thinking to define the concept as something very broad, but then the actual study relies on instruments that measure something much more limited.

A number of large meta-studies[4] have come to partially different conclusions, but the overall picture is that college students' critical thinking—as measured by this type of standardised test – often does not seem to improve in any decisive sense (Arum & Roksa, 2011; Huber & Kuncel, 2016; Niu et al., 2013). This may

[4] Metastudy is based on a scientific method that systematically brings together a large body of research to create a new research result. For example, research on the "number of apples" and research on the "number of oranges" are brought together to report in a meta-study what the research says about the "number of fruits." The advantage is that you can create a picture based on a large body of research whose results would otherwise be difficult to compare. The disadvantage is that many specific and unique circumstances of the individual studies are peeled away, apropos of comparing apples and oranges.

sound discouraging, but the kind of source criticism and critical thinking that we address in this book is definitely something that can be learned in formal education and is of a partly different nature in two respects. First, we are talking about something other than more or less innate logical thinking skills; second, we will focus on authentic expressions of critical thinking in action, which is something that is not so easily measured by the kind of cognitive tests described above. This means that pupils and students can develop into critical thinkers, but more complex and authentic forms of assessing and exploring this may be required than those most commonly found in the literature. In sum, when someone discusses critical thinking, the question must always be asked, "What are we talking about, really?".

Although source criticism and critical thinking are closely related phenomena, it can be said that critical thinking still refers to something broader than what is usually covered by source criticism. In particular, it may be that critical thinking encompasses more than what is normally referred to in relation to sources, i.e. the object of the critical analysis itself. For example, we will discuss critical thinking also in terms of how one relates to one's own beliefs, i.e. a kind of "source criticism" also in terms of self-criticism and self-knowledge. One could in and of itself see oneself as a kind of "primary source" and call it source criticism, but if it is about teaching source criticism and critical thinking there is reason not to be too creative with the use of terms here. It is, as we have seen, complex enough as it is. One way to describe it is that all source criticism is based on critical thinking, but not all critical thinking is about source criticism.

In the case of critical thinking, we have chosen to approach a more circumscribed definition pragmatically by asking when one would normally say that someone is lacking in critical thinking. The literature on critical thinking that does not rely on quantitative instruments of the kind described above often starts from what the authors themselves, other experts, or others associate with critical thinking, i.e. answers the question "what is critical thinking in your opinion?" (see, e.g., Facione, 1990; Moore, 2013). This often leads to quite broad descriptions. It is arguably likely that these same people would frame it much more narrowly if they were asked, "when would you say that a student, pupil, or other is lacking in critical thinking—rather than, for example, lacking in analytical qualities, independence, reasoning, inferences, or other things?" We believe that the answer to such a question would typically be much more circumscribed, and it is this more more limited meaning that we will work with here.

The closely related but not synonymous term "source criticism" normally refers to the critical analysis of different types of sources, initially of the kind historians of the late nineteenth century and beyond have used to subject the historical assumptions of the time to critical scrutiny. What kind of source is this, how did it come about and to what extent can we believe it to be true?

Critical Thinking and Source Criticism

CRITICAL THINKING is pragmatically defined in this work as what one does and thinks when addressing the issues:

- Is that really the case?
- How do we know—and with what degree of certainty?
- Could it be any other way?

It is thus something that lies very close to the core of classical source criticism, where the very concept of criticism becomes particularly central. Source criticism presupposes critical thinking, but critical thinking is directed at a wider field than just what is usually called "sources" and can include, for example, a critical analysis of one's own beliefs, prejudices and assumptions.

SOURCE CRITICISM is about analysing and evaluating sources of various kinds. In traditional source criticism, a set of source-critical criteria is used, all of which have their origins in the early science of history when people tried to sort out what was, for example, myth, propaganda, or actual historical events. Did King X really perform this heroic deed?

- Authenticity—is it a forgery?
- Time/proximity—how close in time to the event was the source created?
- Dependency—if two or more sources provide the same information, are they created independently of each other?
- Tendency—is the source biased for some reason? Who created the source—and why?

Speaking of source criticism, historians today have a less categorical approach to knowledge, but at its core source criticism is itself rather timeless as it is about trying to understand a different time through its surviving sources as best as humanly possible. It should also be noted that historians of the past often found themselves critically opposed to nationalist myths and propaganda in much the same way that medical researchers today relate to superstition and superstition. In the century or so since, the view of the historian's subjective contribution to the writing of history has evolved further. An earlier, more positivist view of knowledge was that the historian's task was to reconstruct what really happened, *wie es eigentlich gewesen*,[5] as a scientific counter-image.

[5] Leopold von Ranke (1795–1886). For many historians, von Ranke's expression wie es eigentlich gewesen ("what actually happened") has come to symbolise a naive view of historian-independent facts, in what we would today call a positivist tradition. Seen from such a perspective, it is easy to miss its actual counterparts. von Ranke's intellectual counterparts were those who engaged in the deliberate falsification of history.

However, critical thinking and source criticism at more advanced levels are rarely about uncovering a simple truth or exposing a deliberate lie. Issues of degrees of certainty are often more interesting and important, where a reasonably equivocal claim may need to be moderated slightly rather than rejected altogether after a critical scrutiny. Something that was said to be "very common that …" might need to be toned down to "it may be that …" after a critical analysis. Moreover, it is often not a question of right or wrong, even in principle, but more a question of deepening an understanding of the context in which the source originated.

One observation is that source criticism today often takes a rather mechanical form in Swedish schools and higher education. The task of including a section on source criticism in every other assignment is now commonplace at many levels of education. When this is done unthinkingly, it risks becoming a ritual and something to be bitten off without always understanding the real meaning of the concept. In the worst case, the lasting experience is that sources can be divided into good and bad ones, with blind faith in the former and rejection of everything in the latter. Such a black-and-white form of source criticism runs counter to the underlying principles of more enlightened and advanced source criticism. Even the most credible sources need to be treated with critical analytical scrutiny, and even the most tendentious sources can offer valuable information if sufficient care is taken. In essence, the traditional criteria of source criticism are about subjecting assertions to critical scrutiny that ties in with one of the polemical questions that we are trying to keep alive throughout this work: *is it really so?*

Between Blind Faith in Authority and Naive Scepticism

Pupils, students and other members of society are expected to be, or at least to become, equipped to question different types of authority in different contexts. The term "questioning" itself usually has negative connotations and usually means being against something or someone, but critical thinking is fundamentally about being able to ask questions in a more neutral sense—where the answer is not at all a foregone conclusion (e.g., Is it really so? How do we know—and if so, with what degree of certainty? Could it be any other way?). Critical thinking can be said to presuppose a degree of autonomy and independence from what one is relating to, but it is not about a pregiven rejection.

The most common envy that critical thinking is supposed to remedy is a *blind faith in authority*. If an adult says something, it is true. If it's in a newspaper, it's true. If it's printed in a book, it's true. If a scientist says something, it is true. And so on. Problematising and countering such blind faith in authority may seem an obvious goal for any teacher or prospective teacher, but something that can be more difficult to deal with in a teaching situation is the extreme opposite, a *naive scepticism*. It is not uncommon for the realisation that authorities can be wrong or biased to spill over into the counter-reaction that, when convenient, we can't believe in anything. It is not then a philosophical, epistemological scepticism with

roots in antiquity but rather an unquestioning disbelief that is selectively turned on and off. For example, a person may come to accept most things about which there is a scientific or another consensus for the moment but may then change their approach if necessary. Because science has been wrong in the past, they may then disregard something that they do not want to be true for one reason or another, on the grounds that we cannot know anything anyway (Munro, 2010). Navigating between these two extremes can be a difficult challenge in many teaching contexts.

One way of discussing this is to explore the limits of what the concept of authority can mean in both positive and negative senses and different ways of relating to them. If an authority like the national weather services claims that there is likely to be a deadly storm tomorrow, do we go out on the open sea in a canoe because of our critical thought about authorities? Probably not. Why, then, do we all have experience with inaccurate weather forecasts? As recently as the 1980s, the authoritative medical research community believed that new-borrn babies could not feel pain and therefore did not need an anesthetic when they had surgery (De Lima et al., 1996). Today we know that was terribly wrong, but does that necessarily lead to the conclusion that we can ignore medical research today that says that overdosing on painkillers is fatal or that arsenic is toxic? Why not? Shouldn't we question everything? Authoritative encyclopedias, such as the encyclopedia *The Nordic family book*, declared in the early 1900s that the Irish:

> ... are unreliable workers and not adult to perform difficult tasks. "Paddy," as the Irishman is usually called, is kind-hearted and trustworthy, but does not deserve trust himself, for he betrays it easily, does not stick to the truth much, is easily irritable, and inclined to violence. On the other hand, he is content if he have but potatoes. (Nordisk familjebok, 1910, p. 854)

Even encyclopedias from the later part of the twentieth century contain what we would consider today to be inaccuracies, although these are not always as conspicuous as in the example of the supposed inherent qualities of the Irish above. Does this mean that we must reject statements in encyclopedias today that the seal is a mammal, that polonium is a poisonous substance, or the encyclopaedia's definitions of the term "parliamentarianism"? If not, why not? Shouldn't we be critical of all authorities? Discussions of this kind are fundamental to any education that aims to promote critical thinking. If we can distance ourselves and our pupils and students from a black-and-white picture in which something is either credible or not credible, then much will have been gained.

What is Being Critically Analysed?

So much for how the concept of critical thinking can be understood. With that in mind, it is time to consider the material itself. What is it that we are analysing critically? One division that is sometimes made is between different types of media, such as oral, written and other sources. Classical source criticism often dwells on the distinction between primary and secondary sources. In this context, we will

instead focus on sources as a kind of "claim" and that different claims require different types of critical analysis.

A classical division of sources into primary and secondary sources was originally about distinguishing between sources and artifacts that originated in the historical event one wanted to study and those that were retold memories one or more steps removed from it. In older history, it is common that there are only a few scarce sources to work with, and one is often forced to try to make the most of the few that are available. In many ways, the work of the ancient historian is similar to the archaeologist's tinkering with fragments from a bygone age. Sometimes one may have to try to understand and explain a historical event on the basis of written sources recorded hundreds of years later, when someone may have written down something that had only been preserved by an oral tradition passed down through generations until then. The retelling of something one or more steps removed also occurs in the present, where it is similarly often desirable to get as close as possible to the primary source. However, while this is important to teach—that is, the proximity principle of classical source criticism—the picture must be problematised further.

While it goes without saying that each such link may contain additional layers of error sources with both unintentional and intentional distortions of the original information, proximity alone does not determine how good a source is in a given context—as if it were merely a whispering game issue. One of the most central principles of source criticism is about analysing the different degrees and forms of possible bias when someone may have reason to distort a piece of information. What are the possible reasons for this particular actor to give as accurate a picture of events as possible? A clear example that many people understand at an early age is advertising in which the person claiming that their fried porridge is the best on the market has good reason to give a biased picture. Later in life, more types of clear tendency problems become apparent, such as when representatives of political parties and the like describe their respective corrected versions of reality. One must also consider much more subtle types of bias, where the person distorting information may not even be aware of their own bias.

This means that while it is very important to take into account the proximity of the source in time and space in a source-critical analysis, it is not a given that it is always the one closest to the event that can give the most accurate picture. Proximity and tendency must therefore be weighed together. Among other things, it must be taken into account that actors at a certain distance from an event may have access to additional information and, for that reason alone, may be able to form a more comprehensive perspective on matters that the person closest to the event could not. In addition, the present is often perceived as chaotic and complex and the past as clearer and more comprehensible. A middle-aged person giving a summary description of a certain time in his youth may have forgotten important things, but can sometimes give a more comprehensible characterisation of a happening only with the distance in time that comes with age. So even the same person may sometimes find it easier to give a balanced picture of something only when a certain time has passed—but then possibly also mixed with errors and memory lapses.

Claims About "How" and "Why"

A completely different type of question to ask of source material is to try to approach the individual "claims" of different sources and attempt to unravel them. One way of looking at it is that a given source can provide answers to different types of questions. If a news journalist claims that a certain type of crime has increased in recent years, this is a kind of answer to two different "how" questions: how much such crime is occurring today and how this relates to a previous level. Another type of claim can be seen as an answer to "why" questions. If the same journalist directly or indirectly claims that this type of crime has increased because a certain social group is experiencing exclusion and that this in turn leads to crime, then this is a causal claim. Why is this type of crime increasing? Because those who commit the crimes experience exclusion. Here it is important to bear in mind that answers to "why" questions always include assumptions about "how." After all, to claim that an increase in crime has been caused by a certain factor is also based on the assumption that it has actually increased.

When examining these different types of claims critically, it is often helpful to first try to clarify what type of claim it is, as these different types are often associated with different types of source-critical problems. If we start with the first example, where someone claims that a certain type of crime has increased, then, as always, we can first ask ourselves, "Is this really the case?" At first glance, the claim may seem like a straightforward statement of fact, probably based on official statistics of some kind. With a healthy scepticism, however, one needs to keep an open mind about possible alternative descriptions. A classic problem in criminology is that crime statistics are usually based on the number of crimes of a particular type reported by victims, which in turn affects how many are prosecuted and possibly convicted for that crime. This means that an increase in the number of reported crimes could be due to an increase in crime of that particular type, but it could also be due to an increase in the propensity to report, which in turn could be related to changing norms over time or what is particularly noted in the social debate at a particular time.

Sweden's first Animal Rights Act was introduced in 1945.[6] If it could be shown that the number of reports and subsequent convictions of animal cruelty has increased since then, most of us would probably assume that it is our values about animal rights and propensity to report animal cruelty offenses that have changed rather than that we treated animals better in the past. The same can be said for many types of criminal offenses, such as school bullying after it was banned,[7] various types of discrimination, environmental crime and many others. We probably don't torture animals more, beat children in school more, discriminate more, or commit more environmental crimes today—regardless of whether the number of reported crimes of those kinds can be shown to have increased.

[6] Animal Welfare Act (1944:219).
[7] The Public Schools Act 1958, Chapter 6, Sect. 54.

An alternative description could therefore be that crime may not have increased at all. "Is that really the case?" The next part of the statement that needs critical scrutiny concerns the possible increase as a comparison between two points in time—now and then. How we define the present and the present may differ, but alternative definitions of the past are almost endless. Do we mean that something has increased compared to how it was last year or compared to how it was in 1927? As is often the case with statistics on complex phenomena, the number of reported crimes fluctuates over time. If you want to capture a trend in terms of an increase or decrease in a phenomenon, the time perspective you adopt is crucial. A simple comparison is stock prices or weather. In a short perspective, the average temperature of the earth may have dropped. In a longer perspective, we may see an increasing trend of rising temperatures instead, which in turn can be used in a debate about human impact on global warming. Both of these claims could be factually correct yet mutually compatible.

As for the claim of increased crime, we can and should, of course, apply the various criteria of classical source criticism. Among other things, we need to ask ourselves whether the person making the claim might have had something to gain from a particular description in a trend analysis. In the case of burglaries and bicycle thefts, a journalist claimed that crime had increased, and given the internal logic of journalism it is likely that a text about a drastic change has a better chance of being published than one about nothing in particular happening. This means, among other things, that the individual journalist might have reason to try to create as newsworthy a description as possible, including the choice of points of comparison in time. Another possible problem of tendency in this context concerns selection mechanisms at a different level. In the example of news journalism, one could imagine two different reporters, each providing a text on the development of crime in the country. One of them might report that nothing particularly remarkable has happened, while the other describes a dramatic change over time. It is easy to imagine financial incentives for an editor to choose the latter of the two, even though both would be equally accurate in substance and the differences in analysis are mostly a matter of selecting different points of comparison in time.

In such a case, we have a systematic tendency problem that is on a different level than the fact that an individual who claims something may have reasons to consciously or unconsciously bias a description. Incidentally, this does not only apply to news reporting. Publication bias has long been identified as a problem in research as well. As in our example of the two journalists, one can imagine two different research groups studying much the same thing. One group managed to show that a particular treatment or other intervention led to clear and statistically significant results, while the results of the other group were less clear. Perhaps the result of their study was that results were ambiguous, and therefore it is not possible to draw very firm conclusions from them. It has been shown that research that can show clear and statistically valid results is more likely to be published in scientific journals, even though in some kind of ideal world these should publish the best research regardless of what the researchers have found.

So it's not that simple. In a study on scientific publishing in the social sciences, the authors showed that studies with a clear result had a 40% better chance of being published than studies with a so-called zero result (Franco et al., 2014). In that particular study, they were also able to show that the main filter was the researchers themselves, as they tended not to submit their ambiguous results to scientific journals. This kind of underlying tendency can in turn affect the overall picture of a research situation, including criminological research on a particular crime trend.

Of course, analysing a research situation requires quite a lot from the individual, and it is not even certain that expert knowledge is enough to get the job done. However, even without such expertise, it is important to be aware of possible selection mechanisms that can affect the overall picture of both news reporting and research. The phenomenon of the dramatic often taking precedence over the mundane reflects everyday life in many ways, and most people can probably testify that they remember shocking events better than others, which in turn can create an overall biased picture.

Similarly, popular historical accounts are sometimes criticised by professional historians for foregrounding the conspicuous at the expense of a more balanced picture. One such example was historian Peter Englund's scathing criticism of the historiography of writer Herman Lindqvist:

> This preoccupation with individuals is also evident in Lindqvist's delight in good stories. I have nothing against stories, provided they are true and can add something to the whole. Unfortunately, one can say neither of these things about Lindqvist's stories. He is a sucker for free-wheeling philosophizing about what someone "must" have "heard" or "understood." Moreover, he can almost never resist the temptation of a really juicy conspiracy. The text, therefore, contains a lot of apocryphal events, winged words of highly dubious origin, warriors of superhuman strength, etc. It doesn't help that the author occasionally labels these stories with a "teaches" or "is told." By thus picking up old tales that historians have kept and purged since the 19th century, his work reveals a past that has actually begun to be remythologized, where truth and poetry are concocted in an unfortunately all too postmodern way. (Englund, 2015/1994)

Similar critical questions about selection processes can be asked of more reliable historiography and, as a teacher, perhaps especially of teaching materials. It is reasonable to focus on what is deemed "important" in such contexts, which in reality tends to be transformative events and formative moments in history, but one might ask what overall picture this creates. Schoolchildren of the future are likely to read about a twenty-first century that we, who live in it, would not recognise ourselves in. For most of us, it is not stock market crashes and international politics that come to the fore in life.

So far about possible critical perspectives on claims in response to "how" questions. In the case of statements answering "why" questions, i.e., causation, we have all the problems of describing *how* something is and layers upon layers of difficulties in proving that something caused something else. *Could it be some other way*? Sometimes it is possible to prove a relationship within reason, but proving

that one thing causes another is usually much more difficult. One thing that often needs to be taken into account is that the actual causal relationship may go in the opposite direction. Let's say that a statistically proven link can be shown between depression and alcohol abuse and that someone claims that over-consumption of alcohol causes depression. How do we know that? Could it be some other way? An alternative explanation could be that depressed people drink more. In that case, it is the depression that causes the abuse, not the other way around. Proving one or the other is almost always very difficult. Often it is not even possible.

Moreover, when it comes to causality and answers to "why" questions, it can be way more complicated than the fact that the causal chain could possibly go in the opposite direction to what someone claims or assumes. People with lung cancer tend to have yellower fingers than those who do not get lung cancer. Does this mean that yellow fingers cause lung cancer? Hardly. Here, of course, is an example of when something else—cigarette smoking—causes both lung cancer and yellow fingers. The colour of the fingers and the cancer are related, but not in the way that one causes the other. In the case of our example, where someone claims that the cause of crime is the perceived exclusion of a certain group, the potential relationships are almost incalculably complex—if even the factual claim about how it is and may have changed over time is correct. One might imagine, for example, that a certain type of crime in a certain type of neighbourhood makes some people choose to move away, but that not all demographic groups have exactly the same opportunities to move. In such a case, we may have a complex covariation between two different types of causality. Young people do not have the same financial resources to be able to choose to move from a crime-ridden neighbourhood, which could at least partly explain why young people are over-represented in different types of problem areas. Perhaps. This does not in any way contradict the theory that the proportion of young men may influence the number of residential burglaries and bicycle thefts. Perhaps some young men commit more crimes than others, and some other young men may have limited opportunities to move from crime-ridden neighbourhoods?

One does not exclude the other, which in turn affects how we approach claims based on a single possible causal relationship. As analytical and critical thinkers, what should we do with these two seemingly contradictory claims? First of all, we need to discern the extent to which the different claims purport to be contradictory and are presented as the only relevant explanation. In this example, then, there is nothing to say that both theories of possible correlation could not be correct. In this case, a critical analysis could focus on claims that are overblown, for example, by claiming that only one or the other possible causal relationship would be valid. This may not be explicitly stated, but often the context will indicate roughly the weight given to a particular factor in a described causal relationship. "How do we know—and with what degree of certainty if we do?" Is it claimed that young people's sense of alienation is an actual cause of crime? Is it one of many possible causes? Is it a major cause? Is it the most important cause? Is it the only cause?

The source-critical analysis must simply be adapted to the explanatory claims of the case at hand. If someone claims that "it cannot be ruled out that…", this

requires a partly different approach compared to if someone claims that "this is how it is!" If possible, it gets even more complicated when a plethora of possible descriptions and possible causal relationships interact in an elusive web of possible relationships. So, a source-critical analysis of a claim about how something "is" simply faces a very different set of problems than claims that purport to answer questions about causation, i.e., answers to "why" questions. This is not to say that descriptions, categorisations and analyses in response to "how" questions are any simpler. Some of the most transformative discoveries in the history of the world have been about explaining how something "is," for example, that the earth is round or that $E = mc^2$. Nevertheless, it adds additional layers of issues that the critical thinker must relate to when addressing "why" questions, such as reverse causality and covarying causality.

"Is that Really So?"

That would concern primary and secondary sources, different types of question in claims in these sources, and different degrees of uncertainty and certainty in claims. An additional perspective in a critical analysis is to ask whether the claim is *falsifiable* or not and whether the source explicitly or implicitly states that it is. Let's say that someone claims that a European movement of ideas during much of the eighteenth century can be called the "Enlightenment" and that it was largely about a great reliance on human reason, partly in opposition to the dogmas of the Church. This, in turn, is said to be intimately linked to scientific achievements of the same period. How can such a claim be subjected to critical scrutiny in terms of right or wrong? Would it make sense to claim that the person making such a description was "wrong," or would we be content to say that the description was more or less accurate?

If we accept the described historical course of events in general, these kinds of claims can mostly be understood as more or less convincing. One objection, for example, might be that the epoch described was not in reality so distinctly delineated in time and that the roots in the seventeenth-century scientific achievements of Newton and others should be included in the epoch presented. Another possible line of questioning could be to criticise the image of this Enlightenment as European in some kind of general sense. Geographically, these cultural upheavals were by no means evenly spread across the continent. A further objection that could be raised is that what we now call the Enlightenment did not have the same hold on all strata of society. An intellectual Parisian at the end of the eighteenth century cannot be lumped together with a Finnish dairy farmer in terms of beliefs about human rationality versus religious rationality. And so on. To propose such an original categorisation of a reasonably coherent epoch of the history of ideas and its placement in time must be open to critical scrutiny, but it is clearly not a matter of being true or false, but rather of more or less convincing argumentation and more or less clarifying descriptions.

The question "Is that really so?" in such a case would have to include more diffuse questions such as "Could this be interpreted and categorised in some other way?" and "Is there a need to nuance this picture somewhat?", rather than a simple right-or-wrong dichotomy. One way to organise a critical perspective, therefore, is, to begin with a question of whether or not what is being claimed is even being claimed to be *falsifiable*. That notion, and a genuine understanding of it, can be seen as central to subjecting a claim to critical scrutiny. In the late nineteenth and early twentieth centuries, a positivist view of science dominated, based inter alia on the ideal of a common theory of science and common scientific methods for all research modelled on the natural sciences. It was a view of knowledge that, by today's standards, can be said to have been based on partly simplified notions of absolute and definitive knowledge. Such knowledge was generally to be achieved by logic and induction, which involved making a sufficient number of observations to support something. This, in turn, was based on the assumption that scientific statements could be verified in principle, in much the same way as in colloquial language when it is said that one could "prove" something.

This notion was challenged, among other things, on the basis of the so-called problem of induction, which deals with the problem that with a finite number of observations, one can never exclude the possibility that a subsequent observation may point in a different direction (Bradley, 2015, pp. 75–110). The problem was introduced in the eighteenth century by the philosopher David Hume, with whom we will become more familiar in the chapter "Philosophical Perspectives." The bird we choose to call "swan" seems to be white. A vast number of observations of this feathered whiteness seem to support this notion. The day a black swan is noticed, however, our series of white swan sightings will have to be understood in a new light. Here we see the heart of the induction problem. No matter how many times one seems to be able to prove a statement correct, a contradictory observation in the future can never be ruled out, for example, in the form of a black swan or two. However, a larger number of consistent observations can be said to increase the probability of something being true, but one never gets all the way to a definitive verification or proof in the true sense of the word.

These and other problems of the theory of science of the early twentieth-century positivism led Karl Popper (1902–1994) to a sweeping critique of positivism and its verificationism. According to Popper, all science was fundamentally about trying to test whether someone was wrong and that a statement that has survived enough such attempts at falsification can be seen as *corroborated*, that is, strengthened, but not *verified*. In a sense, this was an Alexandrian stab at the problem of induction. That an ever so long series of observations could potentially be contradicted by a possible future contrary observation did not have to be a problem if one just failed to see such a series of coherent observations as definitive. According to Popper, a long series of observations was "just" increasing support for a particular theory, such as that what we call swans are always white or that cigarette smoking leads to lung cancer. The task of science was then to try to show that this was wrong. Such a project and such an approach to science came to be known as *falsificationism*.

Moreover, for Popper, the very possibility of falsification was a vital part of his approach to science and determined what he thought should and should not be called science. Statements that could not be falsified were not, in his view, scientific statements. His work on this must be seen in the light of the debates in the philosophy of science at the time. Many of the world's brightest intellects were engaged in the question of what is and/or should be called science. The demarcation between science and something else (unscience, pseudoscience, bad science, non-science, etc.) came to be known as the *demarkation problem*, According to Popper, Freudian analyses, for example, were not falsifiable and were thus by definition not scientific. This, in turn, means that many people today disagree with Popper's delineation between what should be considered science and what should not. If a historian of ideas claims that a coherent current of ideas in the eighteenth century can be called the Enlightenment, is that something that can be falsified or not? Individual factual statements can, of course, but perhaps not the overall characterisation.

This book's argument about critical thinking and science does not stand or fall with such a position. Whether or not a particular statement can or should be classified as "scientific" need not affect whether and how we approach it independently critically or not. Even what someone labels a unscientific claim needs, of course, to be critically examined. Even the claim about the Enlightenment needs to be subjected to the questions, "Is this really so?", "How do we know—and with what degree of certainty if so?" and "Could it be any other way?" The fundamental question of whether or not a claim can be falsified, on the other hand, remains a central issue in critical analysis. Let's say someone claims that "today's teacher education students lack critical thinking skills." This is something that could obviously be investigated and verified whether it is true or not, although such a study would have a lot of methodological challenges to contend with. To do so, one would first need to determine how this critical thinking could be measured. One could then possibly use one of the internationally accepted and validated instruments that measure individual critical thinking or some local invention that is supposed to measure the same thing. The claim is therefore falsifiable; it is possible to imagine a situation where someone would test whether and to what extent it is true.

If the same person believes that "the earth's resources should be distributed more equitably," the statement itself is not falsifiable, at least if we assume that the person is telling the truth about his or her own beliefs. On the other hand, one can ask critical questions about a number of underlying assumptions, even for claims that appear to be non-falsifiable. What does "fair" mean in this context? It is a value-laden concept that can be given very different meanings by different people. Should the world's collective resources be distributed in a completely equal way or just a little bit different to how they are today? If the person means that all resources should be distributed equally between countries and social classes, is it really the case that the same person would accept such a drastic reduction in his or her own standard of living? If so, why doesn't the person give away most of their own wealth to charity?

A clearer example of falsifiability and non-falsifiability in different types of claims might be the distinction between matters of faith and pseudoscience. Believing in a particular god and a particular religious scripture may for many be a matter of faith alone, and it may even be part of theology to regard that faith as unfalsifiable. The notion that God's ways are inscrutable to us humans then trumps all secular observations and all possible arguments and observations. If a child with cancer gets well, it is because of God's will. If the child does not get well, that is also God's will. This kind of belief is clearly not falsifiable. There are many literal religious interpretations that could, at least in principle, be seen as falsifiable.

Some who interpret the Bible's creation story literally are convinced that the earth is only 6,000 years old, that dinosaurs and humans lived side by side, and that the story of Noah's Ark describes an actual historical event. Some of these believers also try to prove their theses with pseudo-scientific investigations, such as archaeological expeditions to Mount Ararat to look for the remains of Noah's Ark or geological excavations to find co-existing remains of humans and dinosaurs (Blancke et al., 2017). Those who engage in this are usually looking to verify various beliefs and are not very open to possible falsification. If they find Noah's Ark, then the literal interpretation of the creation story is verified, but it is difficult to imagine any observation that they would accept as proof that they were wrong. That said, as an outsider, one could still see their claims as falsifiable in principle. Of course, this is also what more conventional scientists engage in when they criticise pseudoscience in its various forms. The term pseudoscience has obvious negative connotations, and it is difficult to imagine anyone in their right mind claiming to be engaged in pseudoscience. A standard definition is that it is a type of activity that purports to follow scientific standards and methodological requirements but then does not.

Of course, pseudoscience is not always linked to religious beliefs. Astrology is a field that some see as a legitimate science among others, with no such links, although historically astrology is understood to have roots in Babylonian and Egyptian religions. Such secular astrology is based on claims that should be quite testable and thus falsifiable. A prominent strand of astrology concerns the alleged link between an individual's personality and the constellations of celestial bodies at the time of that person's birth. On the face of it, this seems like something that should obviously be falsifiable. One just needs to first agree on a quantifiable measure of the personality of some sort and see if the time of birth somehow correlates with the results of that test. Another way to approach a falsifiable claim is to have the source indicate how a supposed correlation would manifest itself. Are we predestined to go into certain professions or similar? This could be investigated quite easily with a large statistical base. In reality, astrologers have not been able to report results that provide better predictions than chance in controlled studies (Zarka, 2009).

Asking the question "Is that really so?" to a claim that could obviously be investigated to see if it is true is partly different from asking the same question to a claim that cannot be falsified. This does not mean that only falsifiable claims need to be subjected to critical scrutiny, but it does affect the kind of counter-questions

that are relevant to ask. If a falsifiable claim is of some kind of public interest, it is highly likely that someone has studied the issue and that it is, therefore, possible to get to the bottom of it. Depending on the specific research situation, there may be a large consensus, for example, that cigarette smoking increases the risk of lung cancer, and this consensus is due to the fact that the claim has been subjected to decades of falsification trials in cancer research, i.e. has been *corroborated* with Popper's terminology. Other falsifiable claims do not enjoy the same consensus. A seemingly ever-changing state of research concerns human nutrition. Over a fairly limited period of time, research-based dietary advice relating to cholesterol, fat, and carbohydrates has changed diametrically. Hence the follow-up question, "How do we know—and with what degree of certainty?".

"How Do We Know—And with What Degree of Certainty?"

An often overlooked issue in source criticism is the degree of certainty with which something is claimed to be true and how universally it is presented as truth and established knowledge. If someone claims that women earn less than men, everyone understands that this is a claim about large populations, not that this is the case in all individual comparisons. The same is true if someone claims that girls mature physiologically earlier than boys. No one would misunderstand such a claim and think that the source is claiming that it applies to exactly all girls and boys on an individual level. One reason why this can be taken for granted in those two examples is that we all have personal experience with individual rich women and poor men, and of boys who reached puberty earlier than some girls in school. In many cases, we have no such common preconceptions, which means that as critical thinkers we must be prepared to keep asking counter-questions to statements that make unclear claims of generalization.

Sometimes a statement can be qualified with various degrees of certainty and uncertainty markers, as we discussed above when we emphasised the importance of expressions such as something is one of many possible causes, something is an important cause, it is the most important cause, or it is the only cause. This greatly affects how we can approach a claim critically. If someone claims that the only cause of lung cancer is smoking, a single observation of a non-smoker with lung cancer is enough to falsify the claim. If someone claims that it *can not be ruled out* that Bob Marley's lung cancer was caused by his cannabis smoking, then falsification is way more difficult. It is quite difficult to show that something is completely uncomprehensible. At best, that kind of precision corresponds to the actual certainty or uncertainty of the source, but we can't take that for granted. Perhaps the most obvious critical analysis is when we question whether the person making a claim really has their feet on the ground, i.e., whether they are exaggerating the degree of certainty. A claim that cigarette smoking leads to lung cancer should perhaps be expressed as saying that cigarette smoking increases the risk of lung cancer, which is not quite the same thing.

We must also be alert to statements that are overly vague. This could be because the source is being overly cautious, but it could also be a case of not fully mastering the language at a certain level. Academic and scientific writing is very much about calibrating statements so that they correspond as closely as possible to the certainty or uncertainty on which they are based. The same linguistic precision is not always required in other types of writing. An entirely different kind of uncertainty can be found in sources that, for whatever reason, deliberately seek to make themselves immune to falsification. A common rhetorical device among conspiracy theorists is to claim that they are "just asking questions." One of the many conspiracy theories about the terrorist attacks on the World Trade Center in New York on 11 September 2001 is that no planes were flown into the buildings at all. A variant of this so-called "no-planes" theory asks whether it might have been projected holograms that tens of thousands of eyewitnesses saw instead of real passenger planes. Claiming that one does not know oneself—that is, a high degree of uncertainty—but that the question should be investigated further is, in such a context, merely a rhetorical ploy to avoid presenting a coherent argument that can be subjected to critical scrutiny. The underlying message is that this is probably how it happened, but literally, the statement is not so straightforward, and the vagueness is meant to serve as a safeguard against counter-arguments.

In many contexts where we need to be critically analytical, evidence is based on degrees of certainty and uncertainty that are concretely measurable and can be expressed in statistical terms. If someone claims that an increase in the proportion of boys and men aged 15–20 in a neighbourhood tends to lead to an increase in local crime, then we should ask not only "How do we know?" but also "and with what degree of certainty if so?" The linguistic marker "tends to lead to" is a signal that the source means that it is not a given causal relationship that is always valid in all contexts, but perhaps that it is common, or even most common? We often have reason to ask ourselves various questions of a quantitative, statistical nature. How much does crime increase, how strong is the correlation and what does it say about this group at group or individual level according to the underlying studies on which the claim is based? All of these can be crucial in a critical analysis of a claim about a causal relationship.

Let's say we have two thermometers, one with a Celsius scale and one with a Fahrenheit scale, and we want to investigate how the two scales relate to each other. If we put the two thermometers in a pot, put it on the stove and measure the temperature of the water at ten different times, the relationship might look like this (Fig. 1.1).

From the measurements, we can see that the Celsius degrees can be obtained by subtracting 32 degrees from the Fahrenheit degrees and then multiplying by 5, divided by 9. Such a strong correlation is usually only found when comparing quantities that are essentially the same, such as age measured in months and years, or our two thermometers. In most contexts, the relationships are much more complicated, as in our various examples of crime and lung cancer. If someone claims that women's educational attainment tends to correlate with their age at having their first child, the evidence for that claim might look something like this in a

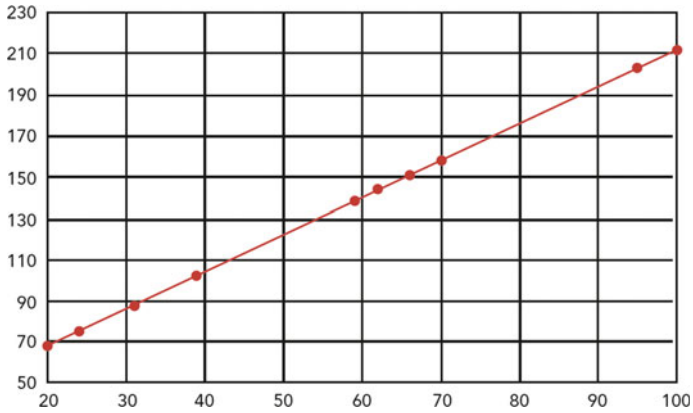

Fig. 1.1 A perfect correlation

given population, with years of education on the x-axis and age at first birth on the y-axis (Fig. 1.2).

This fictional study is based on 50 observations that are at best representative in some sense. If we imagine that we would get roughly the same picture if all mothers of a given generation had been included in the study, we might have to ask ourselves how this rather clear relationship might be connected. The claim that we are about to be subject to critical analysis merely stipulates that the two variables are correlated, not explicitly that one causes the other. This leads us to the follow-up question "and how sure are we?" and what implications this may have at the individual and group level, respectively. The claim that the two variables "tend" to convey is a further specification of a degree of uncertainty. In the chart above, it is clear that some people with a high level of education did have children

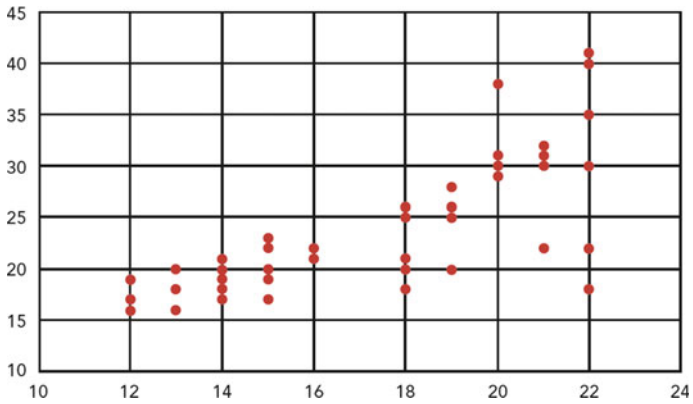

Fig. 1.2 A less than perfect correlation

very early, even though the overall trend points in a different direction. This, in turn, underlines the crucial difference between what is likely to be the case at the individual level and what is likely to be the case at the group level.

If we have found that the proportion of boys and men aged 15–20 in a residential area tends to correlate with the number of thefts in that area, what does that tell us at the individual level? In a statistical sense, when we see such a 17-year-old on the street, he is slightly more likely to have stolen something in the past year compared to the statistical likelihood that the older woman walking behind him has. From a different perspective, those kinds of probabilities say nothing at the individual level. Imagine that in a trial, we have been able to establish that theft from an attic has been committed and that the only two possible perpetrators are a 20-year-old man and a 50-year-old woman. No one would argue that national criminological statistics on gender, age and propensity to offend—so-called criminogenic factors—should be taken into account here. What may be valid at the national level in the aggregate and over time is something almost entirely different from what is valid when dealing with individuals or smaller populations. Moreover, in addition to the difference between group-level trends and beliefs about individual cases, we have here two different types of levels of demand. What criminological researchers can be allowed to say about possible and probable correlations, in general, is a different kind of requirement from that imposed on lawyers in criminal cases. What constitutes "beyond reasonable doubt" is simply different in the two contexts. That, in turn, affects how we can and should critically analyse different types of claims. Is it alleged that the younger man could be guilty? That he is probably guilty? That it cannot be ruled out that he is guilty? That men of his age are over-represented in crime statistics at a national level? And so on.

Often the context suggests that a causal relationship may be complex—that is, not at all similar to the relationship between our two different thermometers—but without a specification of how strong or weak the relationship is claimed to be, it can be difficult to move forward in a critical analysis. In the same way that one needs to ask whether the claim is assumed to be falsifiable, one may need to find out whether there is any quantifiable data on which the claim is based, and if so, what those statistics say about degrees of certainty and uncertainty. In social debate, it is common to claim that something is "increasing" or "decreasing," but it is not always clear whether the claim is based on someone having actually counted increases and decreases or whether it is rather the expression of a general belief that has been propagated on more or fewer sound grounds (for example, what about our claim just now that this is "common" in a social debate?). Moreover, it is not always the case that an alleged relationship can be approached by common sense alone, as in the example of women's education and births, where most people understand that it may differ at the individual level.

In many cases, the previous chart on women's educational attainment and age as first-time mothers would look more like a swarm of bullets fired into the middle of a target. Many would be surprised to know how many of the correlations discussed in the public debate actually correspond to "swarms of bullets" in dot

plots, where advanced statistical methods are required to find that there is even a correlation of any kind—with very large variations at the individual level. Some of the clearest examples of this relate to topics such as diet and health, crime, and various economic correlations. Claiming that X leads to Y may be based on a reasonably substantiated set of facts, but are they of the type of two thermometers, women's births and education, or graphical hail? This is about different strengths of the relationships. To this, we must also add the change itself. A strong correlation between two different factors may indicate a fairly moderate change, and a weak correlation may indicate a more drastic change. Eating an apple a day may prolong life but by how much? Ten years? One year? A thousandth of a second? Popular scientific simplifications about nutrition and health can often serve as illustrative examples of when the degree of change is consciously or unconsciously overlooked. Can I trade an apple a day for a packet of cigarettes or not, in terms of life expectancy?

"Could It Be Any Other Way?"

A debate on US radio discussed a proposed law requiring all publicly traded companies in California to have at least one female board member by 2019.[8] A board member and author on the subject, Betsy Berkhemer-Credaire, promoted the law, arguing that the main argument for such a quota should be business. Companies that had more women on their boards were more profitable, she argued, citing economic research on the subject, including from countries such as Norway and France, which already have such legislation in place. Law professor Kimberly Krawiec argued against this claim. She argued that it would make the proposal vulnerable in the legal challenges that in the US almost always follow in the wake of controversial bills. She argued that the scientific evidence that companies with more female representation are more profitable was not strong enough and that there was, therefore, a risk that the arguments would not stand up to legal scrutiny. She listed a number of possible alternative explanations for the supposed link between gender and profit.

It could be the other way around—a reverse causality—that profitable firms have more time and resources to devote to engaging in progressive reforms of governance structures in the longer term, including a more equal gender balance. Loss-making companies in crisis may not focus on such measures and remain in old patterns for that reason. This could create a statistical link between the number of women and profitability, where profitability causes gender equality, not the other way around.

It could also be that in an unequal society, there is fewer experienced female than male board professionals, but in a context where there is nevertheless a

[8] https://www.kqed.org/forum/2010101866975/bill-would-require-at-least-one-woman-on-california-companies-board-of-directors.

widespread drive to increase female representation, these relatively rare female board members as a group may have more opportunities to choose jobs more freely. The relationship would then be explained by the fact that these women naturally chose more often to work for successful companies than for companies in crisis. In such a scenario, one could thus imagine that a minority of women among experienced board members tend to choose more left-wing companies through self-selection, which could affect the overall statistics in a similar way.

Krawiec also argued that studies on Norwegian and French conditions were not easily transferable to an American context, although she did not elaborate on how these possible differences would have been expressed in the studies in question. Here it is important to underline that Krawiec did not at all mean that any of these alternative explanations would be more likely than the explanation that Berkhemer-Credaire wanted to highlight, i.e., that female executives tend to cause financial gains for the company. She simply argued that the argument that X leads to Y was not supported by the research and that any correlations could have other explanations—and that these alternative explanations could sink the bill when it was scrutinized. She simply asked, "Could it be any other way?" In essence, then, Kimberly Krawiec's argument was that the studies that showed a positive relationship between female representation on corporate boards and the profitability of those companies were not enough to demonstrate that one led to the other.

Demonstrating an association, a correlation, in a limited context is not the same as having proven a causal link. Again, people with yellow fingers tend to get lung cancer more often than others, but that doesn't mean that the yellowing of their fingers causes the cancer. In the ensuing radio debate, Berkhemer-Credaire argued that arguments about economic gain would have the greatest chance of success and that arguments about ideological gains from increased equality would be unlikely to be heard in future court cases. So here we see an example of where two parties seem to want essentially the same thing, and where both parties do not in themselves attach any great weight to a particular argument that more women on boards lead to greater profits, but where they have different ideas about what would be an effective argument in a legal challenge. The conflict between the two thus seems to be initially of a more tactical nature, i.e. which arguments would strengthen one side in future legal proceedings regardless of who may be right or wrong. However, central to our purposes here is Kimberly Krawiec's discussion of alternative explanations.

We can also learn something from Berkhemer-Credaire's example. Without knowing anything more about her than what was presented in the debate, we seem to have a person who is very committed to the issue, has herself worked as a board member and even written a book about promoting female representation at management levels in business. That she may have been less critically analytical of the research pointing in the "right" direction compared to a female law professor who was not as invested in the issue is not surprising. Then we should not forget that one of these was a researcher and the other a working intellectual. That

Kimberly Krawiec came to focus on alternative explanations and possible methodological problems to a greater extent than Berkhemer-Credaire is perhaps not very surprising.

This is in any case a fairly common phenomenon even in research, which means that you have to be extra careful when someone reproduces research on topics that are ideologically or politically charged, which is common not least in many social sciences. Working with the question "could it be in any other way?" is therefore not about necessarily concluding that a claim was wrong. Rather, it is a way of analytically untangling underlying assumptions and seeing if you can formulate a number of alternative explanations, which you then also need to analyse critically. One conclusion after working with the question "could it be any other way?" is sometimes to revise the certainty of the first statement slightly but still accept it as possible or probable. The clearest examples to discuss in a classroom might be statements about causality, where a first step might be to discuss whether it could be the other way around. Does equality cause profitability, or does profitability cause equality? Sometimes these kinds of relationships can be studied empirically; for example, if there are two distinct events happening at two different times where one may always precede the other then reverse causality is not a very likely option. Sunburn does not cause beautiful weather, but most social phenomena are much more intertwined than that.

Moreover, the different options are not necessarily mutually exclusive. Some people may be depressed by addiction, but it may also be true that the same person has been drawn into addiction because of depression. Eggs cause chickens, and chickens cause eggs. In the case of profitability and equality, one can well imagine that both options are valid rather than mutually exclusive. A more multifaceted discussion of alternative explanations of causation might start from correlations where two phenomena exist independently (yellow fingers and lung cancer) but are caused by a third phenomenon (cigarette smoking) which may not even be known to exist or at least not taken into account.

Tendency Analysis

A central component of any source-critical analysis is, as I said, an analysis of the source's tendency problem, asking the question, "Is this really so?" The criterion of authenticity may have gained renewed relevance in the context of what is now called "fake news" (in the sense of fabricated news and news sites, not news media reporting something that someone perceives as negative) but must probably still be seen as a more circumscribed problem in comparison. The criterion of time and proximity remains important, of course, but it is a criterion that was initially developed in relation to ancient history, where the only written sources available had sometimes been compiled centuries after the actual events they described. In a contemporary context, the time criterion is simply many times less acute than the tendency criterion. The dependency criterion is always relevant when analysing several different sources dealing with the same subject, but not all source criticism

is about it. All this is important, but trend analysis can probably be seen as the most all-encompassing of the classic source-critical criteria. It is also the most advanced in the sense that it cannot be ticked off with a simple yes or no. All sources are tendentious in some sense, and it is initially a matter of trying to ascertain in what way, to what degree and what significance this has. Therefore, we will focus specifically on tendency analysis.

Degree of Intentionality—Conscious and Unconscious Tendency

The simplest form of tendency analysis involves determining whether there is reason to believe that a person may be lying. If someone suspected of bank robbery says he is innocent, then that person has obvious reasons to lie if he is guilty, which he may or may not be. At the other end of this scale, we have perspective-taking, where different people give different pictures of the same phenomenon without any of them lying. For example, it is very common for witnesses to accidents and other dramatic events to give completely different accounts of what has happened without any of them deliberately being untruthful. For young children, this can be difficult to take in. For a child, questioning whether someone is really giving an accurate account of something can be seen as synonymous with wondering whether that person is lying. In the case of differing testimonies in the context of, for example, a car accident, one can imagine that the differences are more or less random, but there are situations where different individuals' versions of something take place for more systematic and structural reasons.

Degree of Accuracy

One parameter to keep in mind is that a statement can be correct or accurate to varying degrees. When Donald Trump had delivered his inaugural address as the new US president in 2017, a controversy arose about the size of the crowd. Trump himself—and his press secretary Sean Spicer—firmly argued that the crowd had been record-breaking, but perhaps most importantly, that it had been larger than Barack Obama's equivalent audience, which in turn could say something about the popularity of the two presidents beyond the election results themselves. In fact, a certain number of people had gathered to witness the various speeches at a given time. That number was fairly easy for an outsider to estimate with reasonable accuracy. In that particular case, then, there are a number of objective facts against which those claims can be set. According to crowd-estimation experts, Trump's crowd was only a third of that which turned out for Obama's equivalent speech in 2009.[9] One of these experts suggested that Obama's number was probably 800,000, while some news media reported it was as high as 1.8 million.

All these figures are estimates, and no one figure is likely to correspond to the exact number of people on the ground on the two occasions, which means we have a scale of accuracy to work with. In this context, it is reasonable to see the crowd experts as both the least biased and the most competent assessors, but even they

[9] https://www.factcheck.org/2017/01/the-facts-on-crowd-size/.

were probably "wrong" in some sense (unless there were exactly 800,000 people who saw Obama and exactly a third as many who saw Trump on the ground, which is, of course, conceivable but quite unlikely). When it comes to such degrees of accuracy in various statements, it's important not to think solely in terms of right or wrong. To do so is to run the risk of dismissing a source from which one can learn something, even though it contains something that is not correct. In conspiracy theories, it is common to make a big deal out of single inaccuracies and contradictions in various official versions of an event. The practice of straining at gnats and swallowing camels is symptomatic of conspiracy theorists and should not be confused with healthy scepticism and a critical analytical approach.

The Relationship Between Source and Question

A common mistake is to think that a source has a certain source-critical quality in itself, as if that quality was bound up in the cellulose molecules of a newspaper or in a person's DNA. This is not the case. The source-critical qualities are always related to something, to the context and the questions for which the source-critical analysis would be used. The news media are sometimes described as a dubious source because what they say is usually second-hand information. In many cases, of course, news reporting is fraught with source-critical problems. As far as the proximity criterion is concerned, journalists are often not themselves eyewitnesses to the events they are reporting on. Regarding the dependency criterion, much news reporting is based on journalists having read other news, not least in the case of international news. To this can be added the increasingly widespread use of news agencies such as TT, AP, Reuters and others, which are used in parallel by a large number of different news media. What may appear to the reader as many coherent sources may, in fact, come from a single source. To this must be added various forms of possible bias, where the ideological beliefs of a newspaper or individual journalist can greatly influence the way a story is told.

If one is interested in knowing how George W. Bush thought and reasoned when he and his administration decided to attack Saddam Hussein's Iraq in 2003, the Swedish news reporting of the time is an obviously problematic source. Coming up with a so-called statement of purpose that captures an individual's actual motives and considerations is often very difficult, even though most Swedish journalists did the best they could with the information they had available at the time. This is about the source news media and the question, "How did the American president think and reason?" If we instead start from the question "How was the Iraq war described in contemporary news media?" then mainstream news sources are excellent sources with which it is difficult to imagine any source-critical problems.

The same can be said of what is usually considered extremely biased sources, such as advertising or political party propaganda. If the question is about how the Swedish economy is doing in an election year, then the claims of Social Democratic and Moderate politicians are clearly biased sources. If we instead ask how the two parties present their economic policies, statements from the actors themselves are unproblematic. Despite being ideologically biased in relation to economic questions about growth and unemployment, the very same sources are

in principle biased in relation to questions about how they actually describe the same phenomenon. If we want to know which company produced the best cars in the 1950s, Mercedes and Ford's contemporary advertising brochures are biased sources. If instead we want to know how women were portrayed in car advertising at the time, the same sources are not.

This is about what could be called the factual content of a source or the descriptions themselves in relation to different types of questions. Even when it comes to the factual content alone, we need to consider the type of issue in a trend analysis. Let's say that one is interested in the actual history of a political party, not its self-image or the like. In this case, political party websites are a type of source that may be more or less tendentious in relation to different types of factual information. If we want to know how the Christian Democrats have positioned themselves on same-sex marriage and the possibility of adoption for same-sex couples over time, the party's own 2018 website is a rather poor source.[10] It only states that the party is now in favour of both of these things, but not that it was opposed to them even after most other parliamentary parties had swung on those issues. If, on the other hand, we want to know when the party was formed (1964), what the party was called then (Kristen demokratisk samling) and which years Alf Svensson was party leader (1973–2004), the same website is a fairly reasonable source. A trend analysis must always be based on what in law is called reasonable doubt, and it is difficult to imagine a reasonable reason why a party would deliberately present false information in relation to that kind of data. Again, here we have a case where it is clear that a source cannot have any inherent source-critical characteristics in itself, but that these characteristics arise in relation to the questions asked.

The Relationship Between Whole and Parts

A particular difficulty relates to accurate single images of reality and the overall picture that these single data points together create. If we try to form a picture of a person's life and everyday life by looking at their Instagram feed, we have a plethora of source-critical problems that are very similar to those we have to deal with when reading someone's autobiography. One difference is that it's easier to fabricate facts in a book that you write yourself. Of course, in an image stream, it is conceivable that the person photoshopped something into one or another image, but it is still a bit of a hassle compared to just claiming something that didn't happen in real life. If we imagine a case where the person in question hasn't changed anything at all, neither through Photoshop nor even through various Instagram filters, then it should be obvious to most people that such a feed, taken together, produces an image that doesn't correspond to the person's reality and everyday life—even though every single image is "true" in the sense that everything that appears in the image actually happened. In this, we have two source-critical problems to deal with: perspective-taking in the individual picture, and systematic selection. The

[10] https://kristdemokraterna.se/politik-a-o/.

same source-critical problem can be found in the news media as well as in sources that many see as even more unreliable.

Imagine we have a set of dice from a Yatzy game. The very selection of saving sixes over a number of rounds of Yatzy can be compared to the Instagram feed, where individual truths together create an angled picture. If we test the dice but systematically save on sixes, each individual roll is controlled by chance (if they are real dice) but the selection method of saving on sixes is not. Every single dice and every single dice roll is inevitable but the systematic saving of sixes creates a completely different overall picture. The same kind of phenomenon can occur in general news reporting. The individual item and the individual report may stand up to factual scrutiny, but what about the overall picture? Quite often we can find ourselves in a situation where individual factual claims may hold up, but the overall picture does not.

In the Instagram and Yatzy parables, the selection itself was clearly systematic, with the selector having a clear idea of what to keep and what to discard, giving a biased overall picture compared to if chance had been allowed to rule. The trend analysis in these examples is fairly straightforward because the systematic nature of the selection process is known in advance. It is more fun to share holiday pictures and photos of restaurant dinners than pictures of car queues or the waiting room of a health centre. Sometimes, however, such a selection takes place without a pre-determined idea of the overall picture one wants to convey. News reporting on international politics and conflicts is usually highly simplified, often because the reader's background knowledge can be assumed to be limited when it comes to complex issues that do not directly affect them. Nor is the individual journalist always particularly knowledgeable. Many with special knowledge of a particular international conflict can testify to how painful it is to be exposed to this kind of simplification in the Swedish news media.

However, simplifying a complex process is not a bad thing in itself. Often what can be seen as simplifications of complex phenomena can be seen as clarifications of the type "describe the forest when the individual trees are in the way." A helicopter perspective is not necessarily less accurate than a grassroots perspective. However, as source-critical analysts, we need to look at how these kinds of simplifications can create a misleading overall picture. One does not even have to go to international conflicts to see how simplifications risk creating a misleading overall picture. Take any area of policy that you have knowledge of and contrast it with the way the news media describe it. As a teacher or student teacher, much—perhaps most—of what is reported about Swedish schools seems to range from wildly inaccurate to misleading. The same kind of outrage or perhaps even resignation can be encountered in relation to students with specific knowledge of a particular civil war or individuals' experiences as victims of crime. This is not to say that such knowledge is necessarily more accurate than a common overall picture—someone who has been robbed by a mugger may have developed prejudices about motorists who own 1950s American cars. That said, the experience of having one's own experiences somehow clash with a mainstream media image can hardly be underestimated. It can be a particularly awkward situation when each of

the individual factual statements may bear scrutiny, but the overall picture for one reason or another creates a specific angle.

Credible Versus Non-credible Sources

If a source is considered credible, it is easy to drop a critical approach completely, as if it were something you could just check off. Something is written in an encyclopaedia, or this is claimed by a researcher and therefore the source is credible, and therefore we don't need to think critically about the source, one might argue. Compared to many other sources, of course, encyclopaedias and scientific studies are highly credible in many respects, but as we saw in the section on falsifiability, a critical approach is at the heart of all scientific activity. This means that scientists themselves read each other's work with a critical eye and even actively seek out weaknesses in the reasoning and evidence of others. Does this mean that we should disregard the concept of credibility in this context and approach all sources in the same way? Of course not, but perhaps we should think of credibility in terms of something being worth believing—which is not the same as accepting everything in a particular source as absolute and complete truth.

A related question concerns experts and novices. Sometimes we think that we don't need to question the claims of experts, but what is a so-called expert? What we mean by "expert" can differ drastically from case to case. Is a craftsman qualified to renovate wet rooms an expert on moisture damage? What about a person whose job is to inspect the craftsman's work? Anyone who has done research on moisture damage? In relation to some issues, someone can be seen as an expert, in others not. What about medical expertise? Is a nurse an expert? A doctor? A newly appointed researcher? A world-leading scientist? A Nobel laureate? As always, we need to balance the two trenches of blind faith in authority and naive scepticism, and how vigilant we need to be depends on how we intend a particular expert opinion to be used. No level of expertise makes one immune to the critical thinking of others, but there may come a point where we let our guard down and can and should reasonably rely on authority. If the national weather services claims there is a high risk of a storm tomorrow and a scarecrow claims there will be a lull, we are not likely to give the two sources different weight.

The most important message in a teaching situation regarding the credibility of sources could be to distinguish between a blind faith in authority and a trust in certain authorities in certain contexts, but with a readiness to question them when necessary. In an overall sense, all sources are biased in the broadest sense of the term. The question then becomes in what way and to what extent they are. The older the age, the more abstract and structural forms of tendency may be appropriate to cover in teaching.

Taking the example of the news media, one can imagine a varying degree of complexity in the way a source can be biased.

Deliberate lie to mislead. The headline "Elvis kidnapped by spaceship" is written only to sell copies. It is an example of so-called "clickbait" where the sender deliberately lies for financial gain.

A deliberate lie that supports the sender's image of a truth. Untrue statements to support something the sender believes to be true. The sender may be deliberately untruthful, but the underlying reasoning is that the end justifies the means.

Systematic selection of accurate information in order to provide a biased picture. Deliberate distortion of the overall picture using individually accurate information for ideological or other reasons.

Simplification of complex phenomena because a black and white image is easier to sell dramatically. Many international conflicts are best described in terms of victims and perpetrators. More nuanced images, more parties and more perspectives create a less compelling narrative.

Simplifications of complex phenomena for educational purposes. A simplification can also be an attempt to make sense of something that is difficult to understand.

Lack of skills. Journalists who are not sufficiently familiar with the subject, and who also write under great time pressure, may describe something complex in black and white terms without being aware of it themselves.

Selective reporting without being deliberate misleading. Discourse and ideological assumptions bias reporting more or less consciously.

Perspective taking. When the Swedish press reported on the then newly uncovered extermination camps at the end of World War II, the victims were initially described as "Poles" and "Germans." These were accurate statements, but it would be a few more years before it seemed obvious to describe the group as "Jews" instead. Both statements were correct, but from different perspectives.

Focus and boundaries. A rather advanced perspective on source criticism concerns what is *not* reported in the news media and other sources. The problem is similar to systematic selection of facts, but here it concerns whole subject areas. For example, we learn a great deal about election campaigns, natural disasters and so on from some parts of the world but not others. What does this mean from a source-critical perspective?

So far about possible variations in tendency in a single type of source. Another way to create a progression in teaching is to discuss the nature of different types of sources in terms of degree of likely objectivity. Here it is important to keep in mind the principle of the connection of source characteristics to a particular issue and that they cannot be inherent in the source itself:

Open tendency in advertising, political propaganda and the like
Opinion formation in editorials, opinion pieces
News reporting (see list above)
Popular science presentations
Fact books written by non-experts
Handbook literature written by experts, school books, course literature
Research Compilations
Basic research

All these types of sources contain a range of possible tendency problems of the same kind as in the example of the news media above. By working with these kinds of variations at different levels, a teacher can find a level that is appropriate for his or her own students at a given time.

Lack of Information and Ignorance

A source-critical analysis often involves considering the number of *possible* problems and factors that may underlie and *possibly* have influenced a source or series of sources. This means that an analysis is not just about specifying how much we can trust a claim in a particular source, it is at least as much about trying to gauge one's own certainty or uncertainty. Some sources and claims require expert knowledge in order to be able to say with a reasonable degree of certainty how credible or fair they are. If a news article claims that a research study has now shown that 89% of obesity can be explained by genetic factors, it may be virtually impossible for a non-expert to decide whether this might be new knowledge, whether it corresponds to a consensus in obesity research, or what possible methodological problems that particular study is fraught with. What a non-expert can and should do, however, is to try to create a tentative picture of *possible* critical analyses of sources, and to weigh in this both their own knowledge and knowledge gaps. The position may then end up identifying a number of possible source-critical problems that cannot be ruled out, but that one would need to know and be able to do more to take a position. It is simply a different type of conclusion than stating that the claim or source would have weaknesses in itself.

For example, if we know how science journalism can work, we know that we can't rule out the possibility that a single obesity study discovered by a journalist more or less by accident might be worth writing about, regardless of where obesity research in general stands today. Particularly neat and eye-catching research findings are often over-represented in the news media. Moreover, if we have a general knowledge of the conditions of journalism in general, we understand that it is possible, and perhaps even likely, that a lot of caveats about uncertainties in the original study did not make it into the newspaper article. Note that in this example we have not been able to conclude that any of these problems exist at all, only that they cannot be ruled out because of our own ignorance of the subject matter.

At the same time, there were a number of more general pieces of knowledge that still allowed us to make progress with the degree of certainty we came to attribute to the source. For example, we started from a knowledge of the conditions of journalism in general and of science journalism in particular. If, in addition, we have a picture of the newspaper in question, and perhaps even know the work of the individual journalist beforehand, then we know even more. Furthermore, we started from a general knowledge of the conditions of science, where in a field like medicine you are almost always putting together an enormous puzzle with a worldwide research collective, and where the individual study/puzzle piece usually says very little in a larger perspective.

One way to work with this is to let the pupils or students themselves reason about *possible* source-critical analyses in a progression like in the two bullet lists above. If one is to incorporate a perspective on degrees of possible uncertainty linked to one's own prior knowledge in teaching about source criticism and critical thinking, it is particularly important to set oneself at an appropriate level. Of course, this is always important, but when it comes to source criticism and critical thinking in particular, we have two particular ditches to avoid, a blind faith in authority on the one hand and naïve scepticism on the other, as we discussed in the chapter "What is critical thinking?" (p. 14). If one settles at the wrong level, there is a risk of falling into either of the two ditches. In this case, the idea is to learn to do what might be called tentative analyses of possible conditions in order to frame the degree of certainty and uncertainty in one's conclusions.

This is done by practising speculation about contexts that are only partially understood, as in the example above of the news report on genetic factors and obesity. Here, then, particular attention needs to be paid to the students' prior knowledge and age. Being able to discuss the conditions of journalism and its sifting mechanisms in favour of the conspicuous and dramatic can be done at secondary school level. In terms of the scientific processes in our example and what an individual study might represent, this may not be appropriate until the later years of secondary school and beyond.

To make a tentative analysis of possible uncertainties in the combined example of a science journalistic account of a single medical study that one is not otherwise familiar with—and that deals with a subject that one does not master oneself—is of course a highly advanced task. One could imagine a scenario where such a discussion is introduced to young people who do not have all these general (in)knowledge and metacognitive insights, where the lasting message risks being that journalists lie to sell issues and that scientists are just flipping a coin. Then we end up with *naive scepticism*, which was one of the two nightmare scenarios we were supposed to avoid. One could also imagine a situation where students have to deal with this kind of example on their own and conclude that the newspaper is reliable because it represents "old media," that scientists are always objective and that the statement about 89 percent of genetic factors can automatically be added to the category of right and proper, i.e. they fall into the ditch of *blind faith in authority*.

If you want to discuss this with students at a younger age, you may need to work with simpler and clearer forms of uncertainty and ignorance. A teacher called Ben Smith is interviewed on a news programme and claims that today's youth cannot read and write as well as they used to. Through the questions "Is that really so?" and "How do we know?" it quickly becomes clear that we need to know more about the person in order to have any idea if we should believe that this is right and true. Is this a teacher who is only talking about her own experiences and observations? Is it a teacher who has taken note of research on children's literacy development over time? Is it a newly qualified teacher echoing what older colleagues have told us? And so on. The conclusion may need to be that we know too little to say anything for sure about the weight to be given to the claim, but

this should not be confused with the fact that we have been able to show that it was in fact an uninformed source or a source that drew too far-reaching conclusions. This is about discussions of one's own uncertainty and avoiding the ditch of "blind faith in authority," where it can work relatively easily to open up a possible problem with a source that might be an authority of some kind. As for the "naive scepticism" trench, it can be a bit more difficult.

In a completely free discussion where you are trying to identify *possible* problems with a source, it is easy to come up with a number of possible but *very unlikely* problems. If these are given too much space in the discussion without being problematised, the lasting message of the experience may be that we can't believe in anything, or alternatively that you had a creative discussion with no meaning in real life. One way to deal with this is to start with completely free speculation and then ask students to rank the different options according to how likely these apparently possible problems might be. Perhaps the most likely problem, which cannot be ruled out, is that Ben Smith is making a very general statement about the literacy skills of a whole generation, but where these skills come from a fairly limited anecdotal experience of his own professional life. The inherently conceivable problems that he is bluffing for some reason or that he has had a brain haemorrhage and actually meant the opposite are much less likely.

If, with the help of the teacher, one can create a kind of continuum of possible but differently probable problems, a next step might be to discuss where it might be appropriate to draw the line between reasonable and unreasonable in the context. If source-critical consistency has been discussed at an earlier stage, questions related to it can be brought into the discussion. If some students suggest a very hard-won scepticism, this could serve as an entry point for a discussion of whether they really think it makes sense to go that far in other contexts as well, and whether they really do. The risk of such naive and selective scepticism is that too much is sifted out, plain and simple. All sources of information have potential source-critical problems, and we need to learn even from what is uncertain in some sense.

Psychological Perspectives

It is easy to imagine that source criticism and critical thinking are about uncovering and analysing how others might give misleading or biased pictures of parts or wholes. Who then is this "other" who systematically or otherwise creates an overall picture that forces us to engage in critical thinking and source criticism? This other is as much ourselves. One of the most profound source-critical insights one can help pupils and students with is about approaching their own beliefs source-critically. Those who have succeeded in subjecting their own assumptions to critical scrutiny are much better equipped to take on the claims of others. This kind of self-criticism and analysis of one's own assumptions can be approached from a number of different perspectives. In this chapter, we will focus on psychological ones, with the idea that we as teachers, together with our students, can move a number of steps forward in our source-critical maturity in a process where

we view our own beliefs with the same source-critical gaze that we have hitherto reserved for others.

As early as the seventeenth century philosopher Francis Bacon argued that we are predisposed to think and act in a biased way:

> The human understanding when it has once adopted an opinion (either as being the received opinion or as being agreeable to itself) draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either.eglects and despises, or else by some distinction sets aside and rejects; in order that by this great and pernicious predetermination the authority of its former conclusions may remain inviolate. (Bacon, 1620, cited in Nickerson, 1998, p. 176)

So, if one approaches the issue of source criticism as a technique and critical thinking as a skill alone, one risks misinterpreting many situations where one finds that someone—a student or other—refuses to accept a seemingly well-founded argument. It is not always a matter of ignorance of technology or a lack of ability. Being prepared for the fact that there may also be psychological perspectives on this that are not solely related to knowledge, logic and rationality can greatly influence how one approaches this in a teaching situation. This is a neglected perspective in the critical thinking literature, but we believe that we can all take seven-mile steps in our own critical thinking if we are able to include ourselves in what we critically analyse. Doing so does not require new knowledge or new skills per se, only that we open ourselves up, so to speak, to seeing ourselves as a kind of "source." That, in turn, can be a psychological challenge and this chapter will focus on just that kind of perspective.

If we look at a Wimbledon final or a World Cup football match where we strongly support one competitor, how will we "see" different types of borderline cases? Was the ball in or out? Most of us have probably experienced our own bias *in absurdum* in those kinds of contexts. Sometimes we can laugh at ourselves, but not always. Insights of this kind can be extremely important in interpreting and understanding "the other" and their possible tendency problems (Fig. 1.3).

The figure above is intended to illustrate the relationship between an individual's critical faculties and the same individual's application of these faculties even in situations that might challenge their own beliefs and perceptions. In this chapter we will discuss a number of mechanisms by which we may all find ourselves in that situation. In a case such as the one the picture is intended to describe, the individual could indeed develop further through schooling, but the big gain would be if the same person was able to use existing knowledge and skills consistently. This potential relationship will be a recurring theme in this chapter. In the introduction, we discussed Holocaust denier David Irving and his selective application of his highly advanced knowledge and skills in source criticism. Although as a PhD historian he had demonstrably mastered advanced source criticism, he chose to put these skills on hold in a piecemeal fashion when he set out to improve Adolf Hitler's historical legacy through the selective use of his source-critical capabilities. We argued then that Irving did not primarily need to learn more about the craft of source criticism, but that his pre-existing knowledge and source-critical

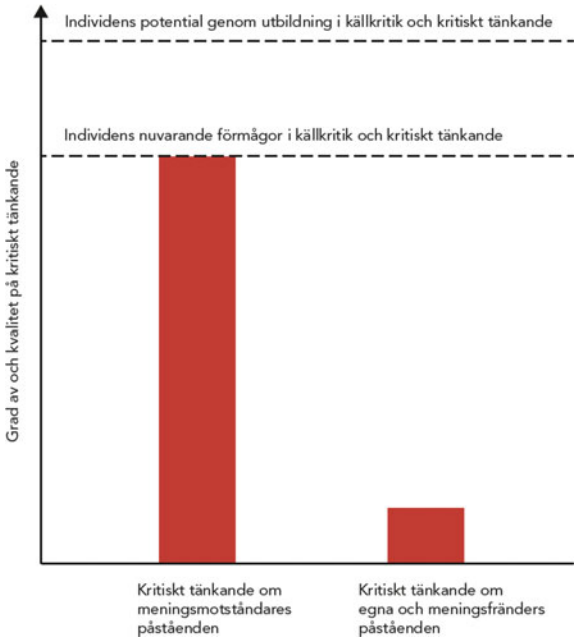
Individens potential genom utbildning i källkritik och kritiskt tänkande
Individens nuvarande förmågor i källkritik och kritiskt tänkande
Grad av och kvalitet på kritiskt tänkande
Kritiskt tänkande om meningsmotståndares påståenden
Kritiskt tänkande om egna och meningsfränders påståenden

Fig. 1.3 Actual critical thinking skills, potential and selective application

capacity should have been used more consistently, and that therein lies the key to what might be called genuine critical thinking.

We are all in danger of making the same mistakes as David Irving, albeit in different contexts from defending Adolf Hitler. Ideologically charged notions tend to be particularly problematic when it comes to what might be called a source-critical self-awareness. Lower taxes lead to higher consumption and thus to higher growth and tax revenues! Raising taxes to finance higher wages in low-wage public sector jobs leads to higher consumption and hence higher growth and tax revenues! An individual's position on an ideological right-left scale tends to determine how one views these two mutually contradictory economic factual claims. The same can be said for statements that are less ideologically charged. If we accept the reasoning behind the principle sketch in the figure above, the main potential, where we can do most in terms of the critical thinking of individual pupils, students and teachers, might lie in finding ways to practice and develop critical thinking about things that are in line with one's own beliefs, not just those of opponents of one's views. This in turn, however, can be a psychological challenge on a personal level beyond knowledge of source-critical techniques and principles.

Let's say someone is arguing for ideas about the equal value of all human beings, that it's bad for future generations to damage our shared environment and that animals shouldn't be unnecessarily tortured. Will that person approach these issues with an open mind that includes subjecting their own assumptions to critical scrutiny? The underlying values may not be falsifiable per se, but we often attach

a large number of factual beliefs to our convictions. Beliefs about human equality may be linked to some notion of genetic similarities and possible differences between people. Beliefs about animal rights may be linked to one or another belief about the ability of specific animal species to feel pain or have specific physiological needs. These are all falsifiable claims. Beliefs about gender equality may be linked to beliefs about inherent genetic characteristics—or perhaps rather beliefs about the absence of inherent differences—between men and women in relation to infants. This may seem hard to digest, but there may be mechanisms in how each of us deals with these kinds of issues that reflect David Irving's selective source criticism, discusses the relationship between facts and normative values in more detail). This leads us to the most pressing question, how can this be understood? One way is to begin by approaching the phenomenon we have here called selective source criticism from a psychological perspective—that is, when one switches between the two bars in the figure above and that it can be explained in whole or in part by so-called cognitive dissonance, or *confirmation* and *myside bias.*

Cognitive Dissonance and Critical Thinking

If someone is convinced that the earth is going to end on a certain date, that person will of course come to realise that they were wrong when that date has passed. Right? Of course, it's quite natural to think that way. If someone can be shown to be wrong in some sort of objective sense, it seems obvious that that person can easily be persuaded to change their position when they become convinced. However, it's not always that simple, and it has been shown that under certain circumstances people can instead come to reinforce and consolidate just such beliefs. A classic study by social psychologist Leon Festinger and colleagues looked at what happened in an American doomsday cult when their prophecy did not come true (Festinger et al., 1956). Based on this and other empirical studies, Festinger developed what came to be known as *cognitive dissonance theory.*

The Scientology-inspired doomsday cult had rallied around the notion that only members of the sect would be spared doom, but made little of this outside their own group. They just worked lazily on preparing for the inevitable doom. When the day of doom came and nothing happened, a series of activities took place. First of all, the leader of the group was able to announce that he had just received new information from the Divinity that the doom had been postponed because of the purity and faith of the sect. The very belief in doomsday thus becomes the explanation for the failure of the prophecy. It was a form of ad hoc explanation,[11] where beliefs about reality had to be adjusted in order to maintain a superior belief with which reality had come into conflict. A classic example of a so-called ad hoc explanation is the Catholic Church's reaction to Galileo Galilei's (1564–1642) discovery that the surface of the moon was composed of mountains and

[11] From the Latin "for this," meaning "for this particular (and temporary) purpose".

valleys. This contradicted the Church's belief that all celestial bodies were perfect spheres, which in turn testified to God's perfection. Galileo's observation could not be dismissed so easily because anyone using his newly discovered telescope could see the same thing. The Church's explanation (ad hoc) was that the moon must be covered by a transparent material that could not be seen in the telescope, and that this surface in turn must have constituted a perfect sphere (Magnani, 2009, p. 88; Reznek, 2010, p. 94 ff). Galileo was subsequently condemned by the Roman Inquisition for continuing to disseminate his heliocentric, and other, results and was subsequently placed under house arrest until his death.

Back to our cult members and how they reacted to the leader's turnaround. Not only was the explanation accepted, but from that day on they also became much more outspoken and came to propagate their own beliefs more and more actively in the outside community. Festinger concluded that the conviction of their own doctrine had been strengthened and intensified *because* of the event that outsiders would normally see as proof that they had been wrong. The earth did not end and *therefore* they became more convinced of impending doom. Cognitive dissonance theory explains this by saying that there is a cognitive gap—a dissonance—between a belief and an observation about reality. According to this theory, we find it difficult to deal with a dissonance if it is about something that we find particularly important and urgent in some way. In many cases, of course, we can imagine changing beliefs in the light of new knowledge, but in some cases we have invested so much of our own identity, social capital and so on in the original belief that it is the new knowledge about reality that needs to give way in order to avoid a dissonance. Depending on the size of the "gap," varying degrees of seemingly unconscious adjustments may be needed to restore the balance. Thus, if someone digs in their heels with particular frenzy, it cannot be ruled out that it is not only *in spite* of effective counter-arguments but *because* of them. An argument simply risks fuelling a vicious circle, with increasingly entrenched positions.

Even in more mundane contexts, one may need to ask whether such an original notion has intrinsic value for the person with whom one is discussing it. Has the person invested so much emotionally and socially that a maintenance must be given precedence no matter what it is contrasted with? One way to discuss this is to work with questions rather than assertions. Is there any possible event or observation that might lead you to consider that it is otherwise? Approximately what might that look like?

It is easy to ridicule Festinger's described doomsday cult and its members' increasing convictions in the face of conflicting observations. For some reason, by the way, we are often less mocking when it comes to larger and more established belief systems. Anyway, less dramatic adjustments are something to be aware of both when it comes to one's own beliefs and those of others. In a more mundane sense, one can learn from cognitive dissonance theory when trying to understand why someone—including oneself if one has sufficient self-awareness—is seemingly impervious to arguments, no matter how compelling they may seem. What happens when our most basic beliefs are contrasted with a contradictory statement of fact? Do we embrace this newness, do we simply dismiss it, or does it even

cause us to consolidate our original position—and not just in spite of, but even BECAUSE of, the new, and contradictory, information?

An American study by Brendan Nyhan and Jason Reifler (2010) examined how a total of 325 subjects reacted to a number of news articles about controversial topics. Some read news articles that contained inaccuracies and others read the same articles but also corrections that pointed out these inaccuracies. It turned out that the subjects' ideological beliefs determined which inaccuracies about the run-up to the Iraq war, tax policy and stem cell research they believed in. The most striking finding was that subjects became morde convinced that they were right when they were shown corrections that pointed out factual errors in news reporting that matched their ideological beliefs. Thus, from being fairly convinced of something, they became even more certain of their position after being told that news reporting that was in line with their own position contained inaccuracies. Being shown to be wrong thus reinforced the original belief. This reaction, which Nyhan and Reifler call a *backfire effect*, is similar to Festinger's observations of the supposedly convinced doomsday cult over fifty years earlier, where a correction when something is shown to be wrong strengthens rather than weakens the previous position.

Other studies have come to similar conclusions. Sol Hart and Erik Nisbet (2012) examined how 240 Americans responded to simulated but accurate research information about scientific findings on climate change and how these were likely to affect different population groups. One background to the choice of this question is that it is highly politicised along a fairly clear right-left political spectrum in the US today, unlike other parts of the world where the very scientific findings themselves are often fairly apolitical. It turned out that those who received the information were strengthened in their beliefs compared to a control group who had not read the same thing. Those who had already dismissed the human impact on climate change before the study were thus more convinced that they were right after receiving information to the contrary. In the literature on research information, this is sometimes called *the boomerang effect*, when the intention to influence through information has the opposite effect:

> A boomerang effect occurs when a message is strategically constructed with a specific intent but produces a result that is the opposite of that intent (for a review, see Byrne & Hart, 2009). For example, antismoking messages can increase predispositions to smoke (Wolburg, 2006), antilitter messages can increase predispositions to litter (Reich & Robertson, 1979), and appeals for donations to impoverished children can lower donation rates (Small et al., 2007). (Hart & Nisbet, 2012, p. 704)

Another perspective in research on resistance to conflicting research findings is what is sometimes referred to as the "scientific impotence discounting hypothesis" (Munro, 2010). This is a reaction to conflicting scientific findings that does not involve necessarily rejecting the findings or the methodology itself, but instead choosing to dismiss scientific findings altogether. So, when we ourselves—or a pupil or student— reject something on the grounds that science has indeed been wrong in the past, one could think of two different types of explanation. One

is an acceptance of what the historian of science Thomas Kuhn (1970) called paradigm shifts, in which a so-called normal science can dominate until enough divergent observations and beliefs challenge the paradigm in such a pervasive sense that it needs to be replaced by a new paradigm. Another possibility is that the questioning is thus rooted in a less sophisticated critique of science, in which the occasional misinterpretation of science is used as a pretext for a selective dismissal of scientific results—when it suits.

This is about the acceptance or rejection of scientific studies. Research on this type of issue is often complex, but there are examples that show that those with less knowledge on a particular issue may be more convinced than others that they are right (Bullock, 2007; Kuklinski et al., 2000). Putting these perspectives together, a picture emerges that every teacher may need to have knowledge of. It is probably troubling for most of us to think that the arguments that we often consider strongest—the logical, scientifically based and factual ones—may also arouse the strongest resistance, and not only that. The evidence and arguments may even drive the other person further away. The question is how we can address this problem in a teaching situation. One way to go is to allow students to explore their own beliefs in relation to various factual claims that run counter to their own beliefs. Possibly, one could argue that every teacher needs to test their own corresponding beliefs in the same way in order to tackle this rather challenging task in a good way. If we only approach "the other" as a lesser known who is to be cured and become more equal, more devoted to democratic ideals or whatever, we risk missing the mark.

In the discussion above, it was mentioned that there were studies that showed that people who have less knowledge on an issue may be more ambiguous than others, but there are also studies that either show the opposite or that there is no measurable difference between groups with different education, intelligence, or otherwise (Kahan et al., 2017). This is another example of when the ability to be critical of one's own beliefs cannot be linked solely to education and knowledge.

This ties in with a number of other perspectives on what might be called uncritical resistance that are discussed in the other sections of this book, but are here explicitly explained in terms of how the human psyche might be constituted. Thus, being persuaded and how one responds to it is not always about rationality and logic. Sometimes we are almost trapped in our thinking.

We will return to it in a few different perspectives, including when we discuss philosophical perspectives and the relationship between so-called value judgments and natural propositions, for example, Hume's law. If the basis for a presupposition is a normative value—that it is immoral to eat meat, or that criminals deserve punishment—then a number of factual relations can be built up to support this. Being critical of such facts can be particularly difficult if one uncritically links them to underlying values.

Selective Source Criticism—*Confirmation* and *Myside* Bias

Most of us have certainly encountered situations where people we know should know better but sometimes don't seem to see the flaws in their own arguments. How can someone who we know is usually able to think logically suddenly seem to have lost that ability in an argument? Cognitive scientists Hugo Mercier and Dan Sperber argue that human intelligence is not even evolved to deal with rationality and logic (Mercier & Sperber, 2017). According to them and others, our mental abilities are primarily designed throughout evolutionary history to deal with social situations between people—not to solve logical problems or to be able to deconstruct arguments. Being able to function successfully in a group, including forming alliances, conspiring against opponents and cooperating towards common goals, was what determined the reproducibility of individuals—not the ability to analyse arguments, logic and source criticism. The authors contrast a traditional notion of rational humans, *the standard intellectualist approach,* with the notion that humans first evolved as social creatures, *the interactionist approach.*

Mercier and Sperber go on to discuss a study in which proponents for and against the death penalty were able to create increasingly sophisticated and nuanced arguments for their own position, in part by anticipating and responding to the arguments of the opposing side. In one sense, this could create a higher quality argument, but they are more pessimistic about whether this led to critical thinking that gave both positions a fair chance, let alone opened the door for participants themselves to change their minds.

While this experiment reports a real improvement of argument quality, its scope is limited. Arguing about capital punishment made people better at arguing about capital punishment. To make people argue better in a more general way, researchers and educators have had more often recourse to other tools, such as teaching critical thinking. This typically involves lessons about the many (supposed) argumentative fallacies—the ad hominem, the slippery slope and so on—and cognitive biases—such as myside bias. Overall, such programs have had weak effects.

> If people are very good at spotting fallacies and biases in others, they find it much harder to turn the same critical eye on themselves. (Mercier & Sperber, 2017, p. 297).

They argue that collaboration is an extremely complex business. In any given situation, it is often profitable for the individual to free-ride rather than do his or her bit. This, in turn, has forced the emergence of the human ability to orientate in a network of such circumstances, which in turn has forced the emergence of what we now refer to as human intelligence, they argue. In this perspective, abilities such as rationality can be seen as a kind of side effect, albeit a positive one. If we stop for a moment and think about what this might say about ourselves as human beings, it might be possible to move forward in what at first appears to be a rather bleak picture. The question is whether we need to see this supposed

"nature" as something bad in itself. Another alternative is to see our possible predisposition to prioritise social relationships over various beliefs based on formal logic and the like as something "natural." Two other cognitive scientists, Steven Sloman and Philip Fernbach, are on the same track in their book *the knowledge illusion: Why we never think alone* (Sloman & Fernbach, 2018), but they emphasise partly different conditions for our rational thinking and our shortcomings in that regard.

Critical Thinking as a Quality

In the critical thinking literature, a cognitivist tradition of thought dominated early on, where critical thinking was initially thought of as a set of mental abilities of the individual. Some such abilities could be seen as prerequisites for critical thinking, while others were woven into definitions of critical thinking itself. Anyone who can do this can engage in critical thinking. Early on, however, it became clear that a person's capacity for critical thinking did not always mean that the person then acted accordingly. For example, someone who had scored high on one of the major standardised critical thinking tests could then fail to use these abilities in further study and in real life. You can compare it to physical abilities. A person may be shown to have good oxygen uptake during a test, but still choose to lie on the couch in real life afterwards. These insights led even the most cognitively oriented researchers to include "aptitude" (inclination, disposition and attitude) to apply their abilities in the concept of critical thinking early on.

At one level critical thinking is all about the development of certain sorts of skills. These include skills in argumentation and skills in making sound judgments. Employers want evidence of critical thinking skills in their employees, and graduates are assumed to possess these skills. However, skills without the disposition to *use* them are not much use, so critical thinking is about dispositions as well. Critical thinking, as both skills and dispositions, is mainly about the development of the individual. We might call this the individual dimension of critical thinking (Davies, 2015, p. 44).

Here it is important to distinguish between different types of possible explanations as to why a person may not engage in critical thinking even though they seem to have the ability to do so. An intra-scientific explanation could be purely methodological, i.e. that something other than the type of critical thinking that one engages in in real life has been measured. It is often a challenge to ensure that quantifying tests in an experimental, controlled setting respond to the complex and often unique situations that these test subjects are then exposed to in real life. While the test itself may be appropriate, the test situation itself is usually distinct from corresponding situations outside that environment. For example, when someone takes the Swedish Higher Education Examination, it is highly reasonable for that person to approach the task with the understanding that the test designer has designed the questions to measure certain complex abilities, some of which many times can be said to involve critical thinking. In such a situation, it is quite

conceivable that this person will read the test texts with a much more vigilant attitude than when the same person then reads similar texts in a completely different context.

This refers to situations where a person's abilities in a test situation differ from how the person is able to apply them in real life. In this case, there is not so much of an active choice by the individual to do or not to do something. Another type of explanation is about active choices to subject something to critical scrutiny or not. It can be likened to the example above where someone with good physical abilities actively chooses not to use them. Psychological perspectives of this kind can help us understand others'—and our own—resistance to acting as critical thinkers. Another perspective is more philosophical, i.e. how we can understand critical thinking beyond the individual's possible shortcomings.

Philosophical Perspectives

Hume's Law—Facts and Values

When a student, pupil or we ourselves advocate a position and do not seem able to critically examine it, it can be effective to try to analyse and discuss what this is about normative values, as distinct from notions of fact. As we discussed in the last chapter, this can be approached from a psychological perspective, such as cognitive dissonance, confirmation bias and myside bias, but simply telling someone that they appear to have an uncritical approach and that this may have psychological explanations may be ineffective or even have the opposite effect. Another way of approaching the issue might be to discuss instead precisely the relationship between normative values and beliefs about facts. Normative values here refer to beliefs about how something should or ought to be, ideological or cultural beliefs such as "I think a progressive tax scale is the fairest" or "we should keep Swedish as a compulsory official language" (see e.g. Bergström, 1993). It may therefore be something other than aesthetic values such as "roses are more beautiful than dandelions" or "blue is my favourite colour." We usually do not try to analyse the latter two values critically in the same way, but usually just accept that this is the case.

Unlike aesthetic values, it is common for us to argue with others about normative values that we disagree with in terms of the other person being "wrong," in some sense. Here, things quickly become highly complicated if one does not first of all keep the valuation itself and notions of facts apart. If someone argues that we should not build student housing in a particular location so as not to destroy the habitat of a rare newt, then we have a normative valuation that is about prioritising one value over another and a number of implicit beliefs about the facts. These include questions about how rare and potentially endangered the newt is, and exactly what effect student housing on this particular site can be expected to have. Both of these facts could be discussed independently of the underlying

valuation and subjected to critical scrutiny, for example by contrasting different scientific findings.

In order to do so, it may often be necessary to also discuss normative values and how they may—or may not—relate to these facts. For someone who places the well-being of the newt very low on the list of priorities compared to the values represented by student housing, the degree of rarity and possible impacts of housing development are of course of little importance. Here it is also easy to imagine a number of psychological effects on the parties' confidence in various factual arguments, where what might in some way support their own view is accepted less critically and vice versa. This speaks to the usefulness of trying to distinguish between normative values and beliefs about facts in a joint argument analysis. A further step one might take is to discuss the relationship between values and facts per se, and whether they even need to be related from a particular value-theoretic perspective.

David Hume, to whom we referred in connection with the so-called problem of induction, was an eighteenth century Scottish philosopher who has had a great influence on Western thought. One of his theses, later called "Hume's Law," is usually summarised as that one cannot derive *should* from *is*. According to this principle, it is impossible to derive a normative value—such as that all people *should* be treated equally, or that one *shouldn't* torture animals for pleasure—from something that concerns non-normative factual relations, how something is. Hume argued that such a connection could not follow purely logically, but simply moved the question of what is right and proper to another place in the argument (Russell, 2016). In line with Hume's postulate, one can quite easily subject one's own normative beliefs to a test. Would you give up one or the other belief about what is right and proper if, hypothetically, new facts about the facts might? If I believe that women and men should get equal pay for equal work (*emerge*), and justify it, among other things, on the grounds that it is socio-economically profitable (*is*), does that mean that I am prepared to change my position if it can be shown to be unprofitable in any particular context? If so, why not? Or, let's say that we think it is wrong to torture chimpanzees unnecessarily and that we *shouldn't* do it on the grounds that they are intelligent and very similar to us humans. Does that mean we are prepared to change our position if zoologists show that the species is not nearly as intelligent as we thought? Or, are we prepared to give up the belief if geneticists can show that the chimpanzee is not nearly as similar to ourselves as we thought? Probably not. Why then?

This does not mean that statements of fact are meaningless in discussions about what we think is right and proper. For example, one could argue that the intelligence of chimpanzees makes them suffer particularly when they are tormented. That may be a relevant argument, but it still does not answer the question of why it is immoral to torture these animals unnecessarily. We have merely shifted the emphasis from it being wrong to torture chimpanzees to it being wrong to torture intelligent creatures, to it being wrong to torture those who suffer particularly badly. Again, this presupposes that we have accepted the value that this unnecessary suffering is evil, even if the misery can be shown to be particularly great

because of various factual circumstances. David Hume would then argue that the normative value that we should not do this is not derivable from the cognitive capacities of animals per se. Possibly we are left with a specified or reformulated normative value that it is worse to torture more intelligent animals than it is to torture less intelligent ones. In such a case, an intelligence measurement of a particular animal species could determine which animal was worse to torture, but the value itself cannot be derived from that or other measurements.

So what does this mean? Do we need to take a stand again in a centuries-old debate between some of history's greatest thinkers in order to engage in critical thinking and the relationship between values and facts? No, of course not, but as with Popper's falsificationism, the underlying principles can help one to analyse and order one's own thoughts as well as the statements of others. It does not require one to accept everything that these and other philosophers in the same schools of thought argue for. The underlying principles of Hume's law in particular can offer a number of particularly effective entry points for discussion, and sometimes even serve as a way of unravelling entrenched positions where someone may fail to subject their own assumptions to critical scrutiny—whatever one's position on a philosophical debate about the relationship between normative values and notions of fact, including the question of whether it is always possible to distinguish between the two. One possible reason for such a possible deadlock may sometimes be that the person has coupled a deeply held normative value with a set of beliefs about facts, to which these beliefs have been added *post facto.* Given that the valuation may be more or less unshakable, it may be very difficult to accept ever so strong arguments against one or more of the facts that one has in some sense chosen to associate with that valuation. Often it can be very clarifying to try to make this visible and to ask questions about these possible links.

Moreover, sometimes underlying blockages and an uncritical approach can be about emotions and personal experiences, rather than normative values in the first place:

Experience: "My parents love me and I had a good upbringing. When I did something particularly stupid, I could be spanked."

Normative value: "It is morally justifiable for parents to beat their children for educational purposes."

Belief of fact: "Children who are never disciplined become uneducated and poorer functioning members of society."

David Hume would argue that none of these three presuppositions follows logically from any of the others. However, to be able to subject the last statement about the negative consequences of not chastising one's children to critical scrutiny, for example using child psychological and sociological literature and research, may be very difficult for a person with this kind of personal experience. Clearly, it is not just a constructed connection to an underlying value (2) that may be at play here. Any discussion of the merits of non-adopted children's futures (3) risks being linked to a critique of one's own family and experience (1). Even in such a scenario, it may be effective to discuss whether there are any even conceivable facts that could lead the person to genuinely challenge the notion that unaccompanied

children will become antisocial and dysfunctional. Is the claim falsifiable? A long-standing social psychology study that has studied the life outcomes of thousands of people, for example? Maybe, maybe not. Of course, depending on the sensitivity of the topic, one needs to think before deciding how best to engage in a larger group discussion on issues related to individuals' life experiences of this kind.

In this section, we have again dwelt on a number of particularly clear examples in order to illustrate the principles we have chosen to discuss. The views that chimpanzees should not be unnecessarily tortured, that women and men should receive equal pay for equal work, or that child abduction is evil are not particularly controversial today. In reality, of course, it is more often a matter of much less overt normative values, which in turn can make these kinds of discussions even more complex. For example, what if chimpanzee rape is carried out to develop a childhood cancer vaccine? What role do notions of the animal's intelligence and genetic similarity to us then play? What if we replace an endangered newt with an equally rare tick or other parasite?

Furthermore, it is often much more difficult to make this kind of analysis when dealing with values that are strongly rooted in the present. Since the end of the twentieth century, for example, it has become increasingly common to link values relating to interpersonal relations with notions of social construction. In this sense, issues of heritage and environment are often uncritically prejudged, i.e. without critical scrutiny. Because people are equally valuable, any observed differences must be due to environmental factors; this, in turn, is based on the unspoken (and sometimes unthought) idea that social constructs are more easily influenced than physiological phenomena. That argument itself is open to question, and is somewhat paradoxically based on a kind of recognition that "nature" is somehow superior to "culture"—which is highly questionable. It can be argued, for example, that it is far easier to cure a tension headache with a painkiller or to compensate for differences in physical strength with machines and mechanics (heritage/nature) than it is to resolve structural contradictions in a society or centuries-old conflicts between peoples (environment/culture).

Well, similar to what was discussed earlier about naive and selective scepticism, it is important not to analyse the relationship between values and uncritical beliefs about facts only in the light of the values of others and values that stand out as particularly controversial in contemporary times. In order to claim to live with critical thinking as a way of life, the same glasses are needed when it comes to one's own convictions and to things on which there is a broad consensus in the contemporary world, including what in the world of education are called value issues. Are these linked to beliefs about facts which in turn therefore become immune to critical scrutiny? Others' ideas about child abuse are not a particularly challenging case in that perspective. What about one's own ideas about human equality? Democracy? Equality between the sexes? What beliefs about facts do we associate with these ideological convictions? And, to what extent are we open to being wrong about these facts but still perpetuating one or the other normative value?

Being able to do this could be seen as a sure test of our own critical thinking skills and will be crucial in teaching critical thinking in the sense intended here. One way of approaching these kinds of questions is to start with the obvious and the absurd. As a group, 12-year-old girls are taller than boys of the same age. Does this mean that the phenomenon of boys' basketball is somehow immoral, i.e. that boys shouldn't play the game? How could such a link between *is* and *should* even be imagined?

Values First, Critical Thinking Training Second?

An opposite way of working with normative values and critical thinking in relation to facts is to start by giving pupils or students the task of making a moral judgement about something and then work their way up to the need for a set of factual knowledge in order to make such a value judgement. "Should" may not follow directly from "is"—whether we accept Hume's law in whole or in part—but any composite normative argument about what ought to be done or ought to have been done is always intermingled with a number of notions of fact. If someone believes that we have a responsibility to future generations about climate change (should), then much of this is obviously entangled in a number of notions about climatological and other facts, such as the notion that humans affect climate and that we can affect it by changing behaviours (is).

Working with values in education can be effective in many contexts, even beyond source criticism and critical thinking. One of the many reasons for this is that it is easier to discuss one's own values even with provisional knowledge of the facts. It is, of course, a didactic device that teachers have used throughout history. If you want to get a discussion going about a work of fiction, you are more likely to get the discussion going if you start with evaluative questions about things that each person can be their own expert on, such as whether they think Ralph or Jack in William Golding's The Lord of the Flies has justice on their side in their struggle on the desert island. Such a discussion is more likely to get air under its wings than an initial literary question about whether, and if so how, there might be an intertextual connection between *Lord of the flies* and *A game of thrones* (Upton, 2015). Claiming that it is unfair that those who cheat on a test (should) receive benefits is easier than asserting the factual claim that cheating is actually becoming more prevalent in schools and higher education compared to the way things were in the past. Arguing that it is fair that a murderer gets a harsher punishment than someone who misparks (*should*) is easier than arguing that punishment prevents crime in the same way in different situations (*is*). Sometimes a general discussion of something has intrinsic value, but one should not underestimate this grip even when the goal is to teach specific facts in a plethora of topics and contexts.

In the case of critical thinking, it can be a concept that in a sense switches between evaluation and knowledge, when one's own evaluation—which, as argued above, may be easier to put forward and discuss—can serve as a starting point for a critical analysis of existing knowledge and needs for knowledge. One way of

looking at it is that the individual may be to some extent an expert on his or her own normative values, but perhaps not so often on the beliefs about facts that may underpin those values. Let's say you want to teach about Sweden during the Second World War.

Compared to many other countries, there is not a particularly unambiguous Swedish national narrative in relation to the Second World War, and knowledge of Swedish foreign and security policy in particular about this highly formative period in history is often rather lacking (on national narratives, see e.g. Wertsch, 2008). There are various reasons for this, but one of the most important explanations is that individuals, families and the nation as a whole were much less affected by the war than other countries in the immediate area and beyond. This, in turn, has affected the role of the war in the collective consciousness. People with family backgrounds from countries other than Sweden may of course have in-depth special knowledge and perceptions of similar situations in, for example, the Baltic States, Finland, the Philippines, Greece, but not necessarily of Swedish foreign and security policy in particular. In a teaching situation on this subject, it may therefore be reasonable to assume that many people today have knowledge of the Second World War that has largely been coloured by popular culture, not least American film and literature, possibly with special knowledge of a particular region in Europe or the rest of the world, but may only have a relatively vague idea that Sweden was neutral in some sense. One way of approaching such a major issue might be as follows.

The student group is divided into two different groups, which are given different tasks. Each group is given a short description of a strictly defined course of the war with some background information (see e.g. Johansson, 2014), followed by a question about how they themselves think Sweden should have acted. One group is asked to describe how the Soviet Union attacked Finland in 1939 and what Sweden did and did not do. In substance, Sweden declared itself non-belligerent, i.e. not neutral, and allowed a volunteer force of just over 8,000 men to join the Finnish side. The normative question to be addressed is whether Sweden should have entered the war on Finland's side in full. The second group receives similarly limited information about Nazi Germany's attack on Denmark and Norway in April 1940. Denmark quickly surrendered, but the war in Norway continued for another two months, followed by an active underground resistance movement during the Nazi occupation. An important difference between these two Nordic neighbours was their respective geography, with flat Denmark effectively becoming a transport route for German tanks. Norway was simply much more difficult to occupy. The question to that particular group is whether Sweden should have entered the war on Norway's side at some stage.

It is common for a majority in one group to conclude that the country should have entered the war on Norway's side (in the group that had been given a brief description of Norway's situation), and a number but perhaps not as many in the other group to do the same about Finland. When this happens, the difference is at least partly explained by the fact that Nazi Germany's historical legacy of the

Second World War is much clearer than that of the Soviet Union, together with a discourse of victorious power in a more general sense.

Nazi Germany, of course, has a special place as a villain in world history, but it also lost the war. The role of the Soviet Union is more ambivalent—not least in Hollywood historiography. Well, taking the normative positions of the two groups as a starting point, we can begin a discussion of specific historical facts. "Should" is usually taken to imply "can." If someone is assaulted in the subway without anyone intervening, those who had the physical ability to do so without danger to life and limb tend to be blamed more than those who did not have that ability. What realistic military options did Sweden have at the time? What were the consequences of the 1925 defence decision, which in turn was motivated by thoughts about the role of the First World War in European history thereafter? Is it reasonable to think that a country the size of Sweden would voluntarily, without being attacked, take on two military superpowers at the same time, superpowers that were also clearly on a collision course with each other in the near future? Did any single country—including Denmark, Norway and Finland—join the world war for altruistic reasons beyond its own national interests? Who were the real parties in the various phases of the war? When did this happen in relation to the Molotov-Ribbentrop Pact? How did Denmark, Norway and Finland themselves view various forms of Nordic military co-operation in the various pre-war defence negotiations? Were Denmark and Norway willing to weaken their southern borders against Germany in case Finland was attacked by the Soviet Union? Was Finland prepared to weaken its eastern border in case Denmark and Norway were attacked by Germany? And so on.

In such discussions, it often becomes clear that what were first seen as self-evident facts in a more or less black-and-white worldview, linked to normative values of good and evil in the past, are complicated by a lack of knowledge of the facts. This makes it possible to link an individual normative starting point to a need to learn more about history itself, and also a critical examination of one's own prior knowledge. Is this really the case …? How do we know …? And …? What makes this methodology effective is that it begins the discussion with a normative evaluation that the individual pupil or student may not necessarily have been invested in for a long time. In this way, it can be easier to observe how normative values might be linked to beliefs about facts and how these can then be subjected to critical scrutiny. Of course, starting an exercise where participants have deeply entrenched normative beliefs in advance can also work, but increases the difficulty. A context in which people are tasked with articulating their normative values in the teaching situation itself may open up a more open mind about critical perspectives, which can be related to their own beliefs at a later stage.

Of course, each educator must also consider whether a particular normatively and emotionally charged issue might expose individuals in one way or another. Similar contemporary conflicts may, of course, create particular challenges in a heterogeneous group of pupils or students, where individuals may have deeply entrenched beliefs and experiences that the individual teacher may find difficult to deal with. To do a similar exercise on contemporary conflicts or other social

phenomena may therefore require sensitivity to the fact that one or more members of the class may have a particular relationship with that particular subject. This does not mean that controversial topics must be avoided in this type of context, but there is reason to be particularly sensitive when linking normative values to facts to which some, but not all, may have a personal relationship.

Does Critical Thinking Have an Ideological Colour?

Some do, and usually their own political and ideological positions are based on critical thinking. When a representative of a political party has to explain an electoral defeat, it is common for him to understand—or claim to understand—the loss as a communication problem. "We didn't get our message across" is a recurring analysis, the implicit message of which is that voters would certainly have chosen their party if only they had been informed well enough. Sometimes it is a rhetorical device, sometimes it even responds to actual perceptions. The idea that well-informed voters did not appreciate their own party's policies and instead chose an opponent on good grounds does not fit into this kind of rhetoric and/or thinking. When it comes to critical thinking, one can sometimes see the same kind of reasoning. Anyone who maintains a supposedly reprehensible position obviously lacks critical thinking skills, implying that any rational person must come to the same conviction that I have. It sometimes even manifests itself in terms of education and training. Anyone who holds views at odds with mine could obviously be cured with more knowledge.

In a more general sense, it can be said that parts of the critical thinking literature focus on different types of norm critique, which in turn often have a certain ideological starting point (Davies, 2015, pp. 75–77; Davies & Barnett, 2015a, pp. 18–23). Often, norm-critical perspectives are about exposing norms that permeate society without us always being aware of them to critical scrutiny—and then, moreover, often about critiquing those norms from an ideological perspective. In a teaching situation, there are some problems in equating critical thinking with selected parts of a spectrum of values. If a pupil is against universal and free suffrage, this may be a challenge in terms of the school's mission to work on democracy and values, but must this be interpreted as the pupil's lack of critical thinking skills? How do we know that this particular pupil lacks critical thinking skills to a greater extent than a pupil who expresses more democratic values?

An alternative, of course, is to decide in advance that only certain ideological notions can be expressions of critical thinking, but then we have at best created something of a circular reasoning. Here again, one can test one's own understanding of the concept of critical thinking and its limits. Can I imagine that someone who has diametrically different values from my own can at the same time be rational and be able to think critically? If not, perhaps the concept has been given a general positive meaning. What is good is compatible with critical thinking, what is bad is not. One advantage of keeping the concept of critical thinking more open and neutral is that it allows for encounters across ideological and other boundaries,

and thus influence. As the concepts of source criticism and critical thinking have been defined in this work, advocates of child abuse and cruelty to animals, and opponents of parliamentary democracy, cannot automatically be dismissed on the grounds that they lack critical thinking to a greater extent than others.

Further Reading—Literature on Critical Thinking

The literature referenced in this section contains much that can be useful to individuals in their own teaching. If you want to read further, there are different ways to approach research on the didactics of critical thinking. Very simplistically, it can be seen as two different types or extremes of research: generalising and local studies. The first type is often at a level of abstraction that makes it difficult to link to didactic practice. Research with less generalisation often describes things that an individual teacher can relate to more easily. Someone may have implemented a local reform or tested a particular method in a particular context, and then systematically and transparently investigates how this turned out. The advantage of this type of study is that it can be fairly authentic and include fuller descriptions of these implementations. The disadvantage is that they can be so local and context-dependent that even the authors do not believe that the results are applicable outside their own context. In a sense, this type of research can be approached as individual case studies and examples, but which are still somewhat more systematic and more well-documented than mere anecdotal accounts of what someone has done. In this case, they can serve as a kind of bank of "proven experience" if one has enough such accounts to draw on.

Another difficulty is that critical thinking in english-language literature is often given a quite broad meaning. If we also consider that critical thinking is in turn a broader concept than source criticism, it is easy to get lost if it is primarily the latter that one is after. international research on critical thinking is often about a battery of different knowledge, skills and abilities that could be translated somewhat simplistically to be about all thinking that is not about memorising factual knowledge (Ekecrantz, 2017). For example, a preponderance of the research may refer to what swedes encounter in the higher education exam, something that in English would often rather be referred to as reading comprehension or analytical ability. this means that the international literature needs to be approached with a certain degree of vigilance however, a major advantage of this subject is that it is fairly timeless, at least compared to many other fields critical thinking as a field of research is, of course, constantly evolving, but the phenomenon itself is much less ephemeral than many other fields having critical thinking as a way of life and balancing between blind faith in authority and naive scepticism is basically the same today as it was a hundred years ago this means that individuals can benefit from literature that is a few years old, without having to worry too much that new findings have emerged that put everything on a practical level.

One such work is Joan Baron and Robert Sternberg's (1987) anthology *Teaching thinking skills: theory and practice* as the title suggests, it has a cognitive focus,

how to teach students to think critically. the perspective is fairly generic and is part of a tradition that views critical thinking as a universal skill and as something that can be usefully learned separately from individual school subjects and academic disciplines. Another example in that tradition that may provide further inspiration is Jenny Moon's (2007) *Critical thinking: An exploration of theory and practice.*

A more recent and comprehensive volume is Sherrie Wisdom and Lynda Leavitt's (2015) *Handbook of research on advancing critical thinking in higher education.* The content contains much that is also relevant to teachers. one title that could perhaps be described as more advanced and more explicitly concerned with advanced levels is Martin Davies and Ronald barnett's the palgrave handbook of critical thinking in higher education (Davies & Barnett, 2015b) that said, it can certainly serve as an entry point for further reading on at least partially didactic perspectives on critical thinking in formal education, as can Maria Wolrath Söderberg's (2017) article on critical self-reflection in higher education. A research review that might be useful for those who want to delve further, beyond their own classroom practice, is Philip Abrami and colleagues' (2015) article *Strategies for teaching students to think critically: A meta-analysis.*

An overall characteristic of the literature on critical thinking at younger ages is that it generally dwells on various measures of independence and cognitive levels beyond memorisation of disconnected facts. This makes it easy to move away from aspects of critical thinking that are closest to classical source criticism and its boundaries. This means that much can be gained from reading about more advanced levels and then making the necessary adjustments to suit the level of one's own students.

References

Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research, 85*(2), 275–314.

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses.* University of Chicago Press.

Baron, J. B. E., & Sternberg, R. J. (1987). *Teaching thinking skills: Theory and practice.* WH Freeman/Times Books/Henry Holt & Co.

Bergström, L. (1993). *Grundbok i värdeteori.* (2 ed.). Thales.

Blancke, S., Boudry, M., & Pigliucci, M. (2017). Why do irrational beliefs mimic science? The Cultural Evolution of Pseudoscience. *Theoria, 83*(1), 78–97.

Bradley, D. (2015). *A critical introduction to formal epistemology.* Bloomsbury Publishing.

Bullock, J. G. (2007). *Experiments on partisanship and public opinion: Party cues, false beliefs, and Bayesian updating.* Stanford University.

Byrne, S., & Hart, P. S. (2009). The boomerang effect: A synthesis of findings and a preliminary theoretical framework. *Annals of the International Communication Association, 33*(1), 3–37.

Davies, M. (2013). Critical thinking and the disciplines reconsidered. *Higher Education Research & Development, 32*(4), 529–544.

Davies, M. (2015). A model of critical thinking in higher education. In M. B. Paulsen (Ed.), *Higher education: Handbook of theory and research* (pp. 41-92). Springer International Publishing.

Davies, M., & Barnett, R. (2015a). Introduction. In M. Davies & R. Barnett (Eds.), *The Palgrave handbook of critical thinking in higher education* (pp. 1-26). Springer.
Davies, M., & Barnett, R. (2015b). *The Palgrave handbook of critical thinking in higher education.* Springer.
De Lima, J., Lloyd-Thomas, A. R., Howard, R. F., Sumner, E., & Quinn, T. M. (1996). Infant and neonatal pain: Anaesthetists' perceptions and prescribing patterns. *BMJ, 313*(7060), 787.
Douglas, K. M., Sutton, R. M., Callan, M. J., Dawtry, R. J., & Harvey, A. J. (2016). Someone is pulling the strings: Hypersensitive agency detection and belief in conspiracy theories. *Thinking & Reasoning, 22*(1), 57–77.
Ekecrantz, S. (2004). " "Neutralitet", "neutralitetspolitik" och alliansfrihet: En begreppshistorisk propå till forskning och debatt. In R. Björk & A. W. Johansson (Eds.), *Samtidshistoria och politik* (pp. 52-85). Hjalmarson & Högberg.
Ekecrantz, S. (2017). Academic critical thinking, research literacy and undergraduate history. *International Journal of Historical Learning, Teaching and Research, 15*(1), 1–16.
Englund, P. (2015/1994). *Herman snubblar*. Review in Expressen, September 1994. https://peterenglundsnyawebb.wordpress.com/2015/09/03/herman-snubblar/
Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational Leadership, 43*(2), 44–48.
Eriksson, L.T. & Hultman, J. (2014). *Kritiskt tänkande: Utan tvivel är man inte riktigt klok*. (2. uppl.) Liber.
Evans, R. J. (2002). Telling lies about Hitler: The Holocaust, history and the David Irving trial. Verso.
Facione, P. A. (1990). *Critical thinking: a statement of expert consensus for purposes of educational assessment and instruction. Research findings and recommendations.* http://files.eric.ed.gov/fulltext/ED315423.pdf.
Felton, M., Crowell, A., & Liu, T. (2015). Arguing to agree: Mitigating my-side bias through consensus-seeking dialogue. *Written Communication, 32*(3), 317–331.
Festinger, L., Riecken, H. W., & Schachter, S. (1956). *When prophecy fails*. University of Minnesota Press.
Franco, A., Malhotra, N., & Simonovits, G. (2014). Publication bias in the social sciences: Unlocking the file drawer. *Science, 345*(6203), 1502–1505.
Freire, P. (1970/2018). *Pedagogy of the oppressed*. Bloomsbury Publishing USA.
Hart, P. S., & Nisbet, E. C. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research, 39*(6), 701–723.
Harwood, W. (2017). *Dictionary of contemporary mythology* (3rd ed.). World audience Inc.
Huber, C. R., & Kuncel, N. R. (2016). Does college teach critical thinking? A Meta-Analysis. *Review of Educational Research, 86*(2), 431–468.
Johansson, A. W. (2014). *Den nazistiska utmaningen: Aspekter på andra världskriget*. (7th ed.). Studentlitteratur.
Kahan, D. M., Landrum, A., Carpenter, K., Helft, L., & Hall Jamieson, K. (2017). Science curiosity and political information processing. *Political Psychology, 38*(S1), 179–199.
Kuhn, T. S. (1970). *The structure of scientific revolutions* (2 ed.). University of Chicago Press.
Kuklinski, J. H., Quirk, P. J., Jerit, J., Schwieder, D., & Rich, R. F. (2000). Misinformation and the currency of democratic citizenship. *The Journal of Politics, 62*(3), 790–816.
Lipstadt, D. E., Lewis, A., & Dershowitz, A. M. (2006). *History on trial: My day in court with a Holocaust denier.* Harper Perennial.
Liu, O. L., Frankel, L., & Roohr, K. C. (2014). Assessing critical thinking in higher education: Current state and directions for next generation assessment. *ETS research report series, 2014*(1), 1-23.
Longhorn, M., & Hughes, S. (2015). Modern replication of Eratosthenes' measurement of the circumference of Earth. *Physics Education, 50*(2), 175–178.
Magnani, L. (2009). *Abductive cognition: The epistemological and eco-cognitive dimensions of hypothetical reasoning*. Springer Science & Business Media.

Marsh, M. (2013). *Advanced analytic cognition: Critical thinking.* Acorn Consulting.
May, K., & Upton, D. (2015). "Ser Piggy" identifying an intertextual relationship between William Golding's Lord of the Flies and George RR Martin's A Game of Thrones. *Extrapolation, 56*(1), 63–81.
Mercier, H., & Sperber, D. (2017). *The enigma of reason.* Harvard University Press.
Moon, J. (2007). *Critical thinking: An exploration of theory and practice.* Routledge.
Moore, T. (2011). Critical thinking and disciplinary thinking: A continuing debate. *Higher Education Research & Development, 30*(3), 261–274.
Moore, T. (2013). Critical thinking: Seven definitions in search of a concept. *Studies in Higher Education, 38*(4), 506–522.
Munro, G. D. (2010). The scientific impotence excuse: Discounting belief-threatening scientific abstracts. *Journal of Applied Social Psychology, 40*(3), 579–600.
Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology, 2*(2), 175.
Niu, L., Behar-Horenstein, L. S., & Garvan, C. W. (2013). Do instructional interventions influence college students' critical thinking skills? A meta-analysis. *Educational Research Review, 9*, 114–128.
Nyhan, B., & Reifler, J. (2010). When corrections fail: The persistence of political misperceptions. *Political Behavior, 32*(2), 303–330.
Reich, J. W., & Robertson, J. L. (1979). Reactance and norm appeal in anti-littering messages. *Journal of Applied Social Psychology, 9*(1), 91–101.
Reznek, L. (2010). *Delusions and the madness of the masses.* Rowman & Littlefield Publishers.
Russell, P. (2016). *The Oxford handbook of Hume.* Oxford University Press.
Sloman, S., & Fernbach, P. (2018). *The knowledge illusion: Why we never think alone.* Penguin.
Small, D. A., Loewenstein, G., & Slovic, P. (2007). Sympathy and callousness: The impact of deliberative thought on donations to identifiable and statistical victims. *Organizational Behavior and Human Decision Processes, 102*(2), 143–153.
Sporrong, E., & Westin Tikkanen, K. (Eds.). (2016). *Kritiskt tänkande: I teori och praktik.* Studentlitteratur.
Stewart, A. (2017). *Critical thinking in nursing: A critical discourse analysis of a perpetual paradox.* Auckland university of technology.
Thurén, T. (2013). *Källkritik* (3 uppl.). Liber.
Wertsch, J. V. (2008). Collective memory and narrative templates. *Social Research: An International Quarterly, 75*(1), 133–156.
Wisdom, S., & Leavitt, L. (2015). *Handbook of research on advancing critical thinking in higher education.* IGI Global.
Wolburg, J. M. (2006). College students' responses to antismoking messages: Denial, defiance, and other boomerang effects. *Journal of Consumer Affairs, 40*(2), 294–323.
Wolrath Söderberg, M. (2017). Kritisk självreflektion i komplexa frågor: Att hjälpa studenterna att ta makten över sitt tänkande. *Högre Utbildning, 7*(2), 77–90.
Zarka, P. (2009). Astronomy and astrology. *Proceedings of the International Astronomical Union, 5*(P260), 420–425.

Introduction Part 2

2

I read DN's editorial on 13 March 2017—"Är du källkritisk, lille vän"—where the author of the article refers to a survey conducted with young people aged 16–25. The analysis showed that young people were more questioning of mainstream news as a source of information than news stories shared on Facebook. The same article also highlights a concern about the lack of knowledge that student teachers currently have about the critical eye, i.e. that it is a matter of giving student teachers the opportunity to practice their critical eye through knowledge, to raise their critical guard through experience and to have enough tools in their teacher training to be able to teach source criticism and communicate it to students in school. A didactic part seems obvious in a textbook aimed at student teachers. Working on didactics and didactic issues is a fundamental building block in a teacher's everyday life as it is about creating a context. Didactics as part of source criticism is also a way of being forced to examine one's sources by asking oneself the following questions: who? What? How? When? and Why?

This part of the book is aimed at student teachers to give you the basics of an approach to working with source criticism in the school world—with a focus on digital source criticism. The book is very broad and the teaching tips highlighted are fairly general, and you as a teacher can transform these tips to suit the age group in which you work. The book is difficult to age-categorise as it depends entirely on the pupils you have in front of you as a teacher, their individual maturity and digital experience. The younger the pupils, the more guidance from the teacher and the more Googling that should occur (Googling together in the classroom, preferably with the help of a projector so that everyone can see the same approach and then try it out for themselves). The older the pupils, the more sophisticated the tasks will be, forcing them to think for themselves and come to conclusions. It is possible to experiment with the tasks where you as a teacher need to take a clearer responsibility and grip on the task for the pupils who need it. For those pupils who need to be challenged, you can instead make the questions around the task more advanced. I have chosen to group the lesson ideas into two

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A. Rosenqvist and S. Ekecrantz, *Source Criticism on the Schedule*, Springer Texts in Education, https://doi.org/10.1007/978-3-031-14336-6_2

parts. One is preschool up to grade 6 (F-6) and the other is grade 7 up to high school (7-Gy). I have also chosen to use "students" when talking about children in primary school as well as secondary school and "children" when talking about preschool.

One danger of source criticism is the risk of ultimately not believing anything—but children and young people must not become cynical, they must be able to trust someone or something. See this book as an approach and not a stated answer, twist and turn my ideas and make them your own. None of what I have included is black and white; working with source criticism is a living thing. Be sensitive to what students tell you, read and experience. As a teacher, you are the expert in adapting, and coming up with new pedagogical material, for learning situations—all the time with current research and current policy documents in the back of your mind. Work with current cases, something students may already know about and have heard about in the media, and then create a learning situation based on the event. In my experience, many pupils enjoy discussing things they already have a prior understanding of, preferably with others. However, bear in mind that the pace of change on the internet is fast and that information quickly becomes outdated, which is also why I have not included examples of actual cases but instead try to describe more generally success factors and why certain lesson plans have been more or less effective. Different topics invite different students to discuss them, it is about you as a teacher needing to know the group and constantly thinking yourself into the engagement of many students. What works well and sparks a sense of discovery in one pupil one day may capture the interest of another the next. Subject immersion, overview and context are the cornerstones of how you can think, all the time with an ounce of flexibility around your initial lesson planning. The exercises in the book, as mentioned, can be made more advanced depending on age and maturity. For older pupils, it is usually appropriate to widen the horizons further and, for example, to look at the state of media reporting in the world. Strachal and Thurén argue that if the focus is on how people express and articulate themselves on their websites, the sense of the person's real values can also be prominent (2011, p. 27).

On 1 July 2018, new changes came into force in the school's governing documents, changes that focus on strengthening digital literacy in schools. In the revised edition of the curriculum for primary schools, source criticism and digital literacy have been given considerably more emphasis. Digital literacy is one of the EU's eight key competences for lifelong learning. The revised version of Lgr11 states that pupils should "be given the opportunity to develop a critical and responsible approach to digital technologies." It is therefore important that pupils can see the opportunities but also understand the risks of, and develop their ability to evaluate, information. Pupils therefore also need to be given the opportunity to learn to take responsibility for their own use of social media, to practise examining the reality that surrounds them and to examine the space in which they find themselves. In autumn 2015, the Education Committee took a decision to assess the value of digitalisation in schools, its quality and results. They found that some results could be measured as purely positive, including the ASL method, writing to read. This

is a specific model based on the fact that many young children first learn to write and then learn to read, and the method involves teaching children to write their way to reading through a computer or tablet.

This part of the book is divided into nine chapters and is based on what I have chosen to highlight as important elements in source criticism. This, in turn, is based on my experience of working specifically with source criticism in the curriculum for one hour a week for grades 7–9. However, the book is aimed at a wider range of teachers than this, from pre-school through to secondary school.

The first chapter, "Making source-critical arguments," is about developing and making source-critical arguments and after that comes the chapter "Referencing—plagiarising." It is based on common mistakes that my students have made over the years where I have shaped lesson plans to give students knowledge on how to reference "correctly." Chapters 1 and 2 thus go a bit hand in hand and then break off into the chapter I have chosen to call "News Consumption." Next, I turn to Wikipedia, which has been given its own chapter. This includes some history, as the view of Wikipedia as a source of information has changed over the years—from being unacceptable in school work to actually serving as an acceptable reference. The next chapter, "Images and films—what I see, I see, right?", looks at the publication of images but also includes a section on image montage. Conspiracy theories have been a popular topic with my students and this chapter also includes alternative facts with concepts such as "fake news" and "clickbait." As source criticism is included as a knowledge criterion in several school subjects; it has become a chapter of its own and there is a more detailed description of how to work with historical and mathematical sources. The next chapter looks at search engine optimisation and how search results are sorted. This all concludes with social media, a chapter divided into two parts: being safe online and social communication.

Each chapter has its own title and an introduction where you can read in more detail about what the chapter contains, then there are different in-depth sections of the chapter and finally it ends up with concrete lesson tips. The lesson ideas are divided into two groups, preschool up to grade 6 and grade 7 up to upper secondary school. You, the reader, can then choose what is relevant to work with depending on the ages of the children/pupils you teach.

Making Source-Critical Arguments

When we hear, see or read something, it is important to find out WHO is behind the information. Is the person the same as they claim to be? We also need to think about *what* the source is trying to tell us. What is its purpose and *how* is it used? For example, the purpose may be to convey facts, to entertain, to sell something, to scare us or to emphasise opinions. Another thing to think about is *when* the source was created. How old is the source? Sometimes news is spread that is not really news, but an "old story" that has simply been given new life. This in turn results in the spread of misinformation because the news is no longer current. As for the

question *why*? we should be self-critical. Why do we believe this? Is it because we have a personal relationship with the informant or because the message fits well with our own values? Source criticism can be about being critical of your source, but it can also mean reflecting on your own values—what you believe and what you don't. It forces you to be self-critical. An important part of this book is to start from yourself, whatever information you choose to pass on.

Being able to think and reason critically about sources is not about finding the right answer, but about reasoning about the choice of sources. This can be done in different ways depending on the age of the pupils. The syllabus for Swedish in Year 9 states that pupils should reason about the credibility and relevance of sources. It is therefore important that they are given the knowledge necessary to be able to conduct different types of reasoning. One way of doing this is by asking questions of themselves: Who? What? How? When? and Why? By answering these questions, the student is forced to reflect on the credibility of the sources. When they then compare sources with each other, they can also develop their ability to think about the relevance of the source in the context.

Four Principles of Source Criticism

Strachal and Thurén (2011) describe four source-critical principles (see also "What is critical thinking?", p. 14) that I have drawn on to provide students with tools to help them assess information and its authenticity on the Internet. These principles are authenticity, proximity in time, dependence and tendency and are concepts that older students should use to determine the credibility of a source. The principles are particularly useful when working with historical sources—for example, the task on child labour, see "Source criticism in multiple curricula/various subjects" (p. 168).

The first principle, *actuality*, is that you as an internet user should be able to see what is a lie or a fabrication. The second principle is *time*—and proximity in time if it is a historical source. This means that the further back in time you are, the more difficult it is to prove some kind of truth in what is written in print. It is simply a question of pure forgetfulness and the more time has passed, the less reliable is what is actually remembered. Strachal and Thurén give examples in their book where the opposite is true, namely that time can be a more reliable source, but these are usually figures that become more accurate the longer it takes to state them. As an example, the authors cite the number of deaths during the World Trade Center attack, which was initially said to be around 20 000 people, but after a few years the correct figure was found to be just under 3,000 people. How close in time and space is the source of what we want to know about? The closer the better, but sometimes we have to settle for sources quite far from/after what they tell us about. The third principle is *dependence* and is about whether one source is dependent on another source. As I mentioned earlier, it is of the utmost importance to find several independent sources, sources that come from different websites but say the same thing, as this will increase reliability. When I

say "the same," this does not mean that the sources should be identical, but rather that the opposite is true, i.e. that reliability is reduced. Several sources telling the same story are always better than one, but if one of them relies entirely on another source—is dependent on it—it obviously has no independent value as a source. The fourth, and final, principle is *tendency* and it is about whether the information is biased (Strachal & Thurén, 2011, pp. 13–21). Is the source what it claims to be, what it appears to be? A tendentious source is a biased, one-sided, biased source.

Who, What, How, When and Why?

Providing students with tools and strategies to develop their ability to take a critical approach to sources is important. The teaching of source criticism should also be linked to a field of work, so that pupils can apply their knowledge in a wider context. The questions of who, what, how, when and why can be discussed with pupils as early as pre-school level. These questions can then be used throughout school, but the older pupils get, the more natural it is for them to answer these questions themselves, hopefully without thinking about it. According to Annika Sjödahl, subject expert at the Swedish National Association of Teachers, pupils should, by the end of primary school, have consolidated certain abilities in relation to the criteria of information seeking and source criticism in the subject of Swedish. Pupils should be able to formulate search terms in such a way that they get the hits they are looking for, and be able to sift through the search results. Pupils should be able to navigate around previous searches and selected pages and sub-pages, as well as be able to sort through information on the Internet and make judgements about relevance and credibility. Various strategies for assessing the credibility of a source, such as looking at the URL—the Internet address—and reading through the "About" information of a website are also essential, with more on this in the chapter "Search Engine Optimisation" (p. 173). The vast majority of websites have an "About" section where you can read information about the website's existence. Here you can find some answers to the who, where, how, when and why questions that students should ask themselves. Being able to refer to sources correctly is also one of the skills that should be developed in primary school.

Lesson Tips—Critical Reasoning

The lesson ideas below are about how to guide students early on in their search for information by doing it together. With older students, you can work in more detail on how they can practice reasoning about the credibility of sources.

Ages 6–12 Didactic Issues

Start by coming up with a question that students want answered, such as "Why does the giraffe have a long neck?" Let the students guide the search with you as the teacher. If possible, use a projector so that everyone can follow along. This is called *co-googling* and is a good way to work with younger children. You should

take on the role of a guide in the classroom and show the pupils how to go about it so that they can then do the same thing themselves.

Choose a few sources that you think would be good for the class. Then, as a teacher, ask the students the questions (who, what, how, when and why) one by one and let them find out the answers.

When students reach a different stage of maturity, you can work out more developed questions and go deeper into different parts and issues. For example, you could have discussions about why individuals prefer certain sources to others.

Ages 13–18 Didactic Issues

Have students look at advertisements that resemble editorial texts. Provide some examples for students to look at based on a series of questions: is there any interaction between image, headline and textual content? What age range is the ad aimed at? Can the mood of the text be read? What does the image say about the content of the text? How clearly can you, as a reader, see that it is an advertisement? Is there a danger that the advert is very similar to an editorial text? Students can then work on making their own advertisements.

Ages 13–18 Making Critical Reasoning About Sources

For the older students, source-critical work involves reasoning about the credibility and relevance of a source, which is something they work on in several school subjects. As a teacher, you can emphasise the importance of similar reasoning in everyday life, for example when encountering advertising. Students are then forced to think outside the classroom and can find ways to reason from their own reality.

Explain to students that an argument is a train of thought that explains your opinion or position on something. For example, you might argue that a certain type of source has low credibility and then, when you explain what you base that on, you make a reasoning statement, such as: what in the source is not reliable? The quality of a source-critical argument depends on three different things: first, the argument should have a source-critical breadth where you should be able to describe the different strengths and weaknesses that the source has. You can do this by thinking about credibility and relevance (why is the source important to your question) and the advantages and disadvantages of the source. Secondly, it is important to give concrete examples where you link the source's content to your own arguments. Thirdly, it is important to show a context, where you evaluate the source based on your knowledge (new and old) and the context of the source.

To practise critical reasoning, you could have students work on a task where they can reason about the credibility and relevance of three different sources, such as privacy on the internet. Pick three pre-determined sources, the first of which could be a blog post from a privacy expert or professor of computer science. Try to find a source that brings out both positive and negative aspects of keeping a low profile on the internet. Include concrete examples and review these with students. Then let students search the text themselves for pros and cons. Ask students if they think the author of the blog post knows his or her subject and let them discuss and reflect on this. Then pick out the other source that gives a one-sided and biased

view and only describes negative things about keeping a low profile on the internet. Let students find biased positions in the text themselves. Then discuss how this type of source is biased because it clearly takes a stand on its thesis. However, point out to students that the source can still be useful, but you need to back it up with other things you have found. The third source in the example should be from encyclopedias, such as a Wikipedia article. Wikipedia is special in that all the information comes from the users themselves, with more on this in the chapter "Wikipedia as a source of information" (p. 143). Talk about how the quality of articles can vary and that each article should be examined individually. Encourage students to pay attention to word choice to see if the text is biased or tendentious. Allow students to reflect on this themselves as they read the text, preferably in small groups. Then talk about how a good article on Wikipedia should be based on many good sources. You can also see if there is a dialogue for improvement under the discussion tab of the article, and look at the history and see if there are many contributors to the article. When carrying out the task, it is important that the teacher remains neutral so that it is really the pupils themselves who, in discussion with each other, develop their reasoning. This means that the pupils twist and turn their text in order to obtain the most credible information possible. Students should be able to talk about why they chose one source over another, but it is important that as a teacher you also talk about comparing several sources: "I chose this source over this one because …" and "What I missed in the other source is …". This is an opportunity for students to practise their critical thinking skills; there is no right or wrong. By using this type of reasoning and reflecting on what they have read, pupils engage in critical analysis of the source.

This type of task can also be developed by giving students more influence on what they want to reason about. Something that tends to work well is to have a range of topics that students can then choose from, such as whether energy drinks are dangerous or not, whether it is harmful to play computer games or whether you can become addicted to your mobile phone. Students choose one of the topics or come up with their own suggestions, but these need to be agreed with the teacher before work can begin. Once students have started a text by answering the question using the information they have found on the Internet, it is time for them to justify their sources and the choices they have made: "I chose this source over this one because …" or "I consider this source credible because …".

In order to make the students' texts reasoned, they can use different reference marks, for example: "One source means/says/asserts/claims/writes that … while another source means/says/asserts/asserts/writes that …". By considering both positive and negative sides of the same coin, the argument becomes interesting. Do students get the feeling that the source wants to influence them to think a certain way? Look at the origin of the source, could this have an impact on its credibility? Does the author appear by name? If so, can they go further and see if there are other articles or texts this person has written? Would that then increase/decrease the credibility of what you are reading? Are the sources the pupil has chosen to include in his/her text relevant? Why has the pupil chosen these particular sources? Below is a student example from a girl who did the task above. She chose to focus on the "good or bad" of energy drinks and then wrote a reflective text on the choice of sources.

My first source was a study cited in News24 from www. onlinecjc.ca. A scientific study written by a woman named Eileen Leahy. When I googled her name, it turned out that Eileen Leahy is also the name of a character in a TV series, so it was hard to find anything about her. However, I could see that she had many articles on onlinecjc.ca, which makes me think that she is a person I can trust. Everything in the study has sources and is well written. In the source, they say exactly the same thing as the FDA, that it's okay in moderation (no more than one can a day). In this source they do not address the pros and cons, as it is a study on the effects and use of energy drinks. I think the source is reliable, because they showed sources, and were able to account for everything they said with facts to back it up.

The second source was News24. News24 has many clickbait articles, news based on fear or curiosity (e.g. "The disease that shocks everyone! How to avoid it"). That's why I avoid all their articles. In this article, the headline is "New alarm: Drinking regular energy drinks can be deadly" even though the article they quote says it's okay to drink up to one can a day. They also quote Aftonbladet's article, which News24 borrowed heavily from. The article is very short so there are no direct errors in it that I can point out." (Kim Josephine Selland Alerås)

Refer—Plagiarise

In this part I will highlight why it is important to reproduce information, with copyright and referencing procedures also included here. The aim is for students to gain knowledge of how they can avoid exposing themselves to "copying" or copying what someone else has written, but also what applies when using quotations. Depending on their age and maturity, pupils will become familiar with the word "source" and what it means. Why should there be a source reference if the choice is to take parts of a text and make it your own? Otherwise, what happens? Is it legitimate to use quotation marks but to change the content slightly?

The older students get, the more information search is done via computers and they are given tools to search for information and to be able to correctly reference in texts. For example, here I give tips on how students can think about what a school project might look like so that it does not plagiarise what someone else has already written/published. For the older students, let's say middle school and high school (something that can be very individual though), reference markers are introduced where a natural step will also be to get familiar with the Harvard system.

Information Search Tools

We return to my first example from the section on source-critical reasoning. You have a student in front of you who wonders why the giraffe has a long neck. To find this out, it can be googled, but how? Searching for information and images online can result in a lot of hits and it is therefore easy to get lost among the information that appears. Pupils need the knowledge to search for the right information. As a teacher, you should be a guide here and show the different success factors for

"googling correctly." Some ways are for students to type several words in the search field, to rearrange the word order and to have a discussion about credible hits, preferably with a peer or a teacher.

It is important to note that the top hit is not necessarily the best, but Google misses a lot and the computer knows which pages you have visited before (more about this in the chapter "Search Engine Optimisation," p. 173). By training students to search correctly, fewer hits can be approached. Looking at several hits and then comparing them will also allow conclusions to be drawn about the credibility of the information. First, think about what you want to know in order to narrow down your search, and then think about keywords where you can combine several words, or use synonyms. It is also possible to customise searches by typing "last week" under advanced search. You can also enter words that should not be included in the search. Being able to search in English can also broaden the search results and possibly make them more relevant to the task.

Being able to adjust the number of hits is also important. If the search results are too extensive, there are various ways to limit the search. You can advance the search by selecting only pages in English—or limit the search to a specific website. If you know that you are looking for a thesis on giraffes from the University of Gothenburg, you can type "'giraffer' site:gu.se." You can also be more specific in your word choice or add more keywords to get a more accurate list. If you know that you are looking for an entire phrase, you can use quotation marks, but you can also choose to remove hits by putting a minus sign in front of certain words. For example, "giraffes—Kenya" to get information about giraffes in different parts of the world—but not in Kenya. If you know what type of document you are looking for, you can add "pdf." After adjusting the number of hits, you will need to save the link so that you can refer to it. Also note the date you retrieved the information, as online pages are often changed and/or updated (see more under "The Harvard system," p. 131). Another consideration you should have is "Who is saying what to whom and for what purpose?", but only after you have looked at different sources and asked yourself the question of credibility.

Lesson Tips–Sources and Information Search

The lesson tips below look at how you can introduce what a source is in a more playful way to younger children, and then go into more detail about how students can use mind maps and support words to recall information of different kinds.

What is a Source?

For ages 6 to 9, the word "source" can be introduced in a fun way. The word can be played with and to make the meaning of source become where it comes from, for example, the source of water can be introduced and you can let the pupils think about where the water source could be. Continue by having them make up their own "sources" of different things, such as source of health, source of joy, source of energy, source of power and source of heat. They can also use nonsense words, such as a friend source, i.e. words that don't really exist but still show the correct usage and an understanding of what the word source means. The next step is to

introduce other types of sources where the information is instead written down or documented in some other way. For example, rune stones, gravestones, fact books about animals/nature/lands where you discuss with the children the meaning of the word source in the different contexts. What might a "source" on the internet look like? Pupils can be asked questions which they then want to investigate, such as "Why are some eggs brown while others are white?", and then reproduce their sources after having received the answer to their question. Again, co-googling is appropriate, but based on what students show interest in. As a teacher, you should share with pupils the tricks of the trade on how to conduct a search in order to get a "real" answer.

Ages 6 to 12 Searching and Retrieving Information

The older students get, the more digitalisation is introduced. Already in grades 4–6, they should be able to search for information on the internet. Have students google short factual texts that they can read through and then make mind maps around what they remember. Retelling this to a classmate then shows that they are recalling information in their own words. By reflecting on knowledge that is already consolidated, students practice the ability to also distinguish between their own knowledge and new knowledge. However, "looking it up" is not enough; in the context of the didactic questions from the chapter "Reasoning about sources" (p. 113), students are given the opportunity to have a solid foundation for smart online navigation.

Ages 13 to 18 Searching and Reproducing Information

Here is a suggested task where students are given the opportunity to practice their reference management skills and gain an increased awareness of how a report should be written. Students are encouraged to use synonyms and to read the text first and then write down supporting words. In the next step, they can remove the text and retell the content by looking only at the supporting words. The task could be to rewrite a text taken from Wikipedia; in the example below it is a short text about a west coast community, Grebbestad.

Have students first read the original text and then read example 1. What are the differences between the two texts? How did the person who wrote example 1 go about composing it? What could the person who wrote example 1 have done differently? After the students have discussed and made notes/marks on example 1 in small groups, they can read example 2. After reading example 2, the students can think further about what makes the two example texts different from each other and how the person who wrote example 2 has done things differently compared to example 1.

Original text from Wikipedia

The area has been inhabited for a long time. Nearby are several ancient monuments, including Greby burial ground from the Iron Age, a stone labyrinth and an ancient castle.

The first time what we now call Grebbestad appears in historical sources is the beginning of the seventeenth century. At that time, the inhabitants of Grebbestad left their mark in tax registers and as settlement markers on maps. When Pehr Kalm visits Grebbestad in the 1740s, he meets a population of beach dwellers, who he believes are doing quite well.

During the nineteenth century, society developed and industries such as trade, shipping, canning and fishing took over. Timber and grain were shipped out. In 1858 there were seven freighters in the community and sometime around 1870 a canning factory started up below Stöberget. Characteristic of this type of coastal trade were the many large port warehouses, but unfortunately they no longer exist. In the last decade of the nineteenth century the stone industry started. Many stonemasons moved in, including from Blekinge.

Nowadays, these industries have outlived their role and it is tourism that provides the main income for the community. Grebbestad became a seaside resort as early as 1844. At that time, mud cures were a speciality because the mud in the sea bay was considered to be healthy. Grebbestad had both cold and hot baths during this period. The longest preserved was the cold bath house, which was demolished in 1974. The site of this was the beach below the Grebbestad campsite, at the southern entrance to the village.

Example 1

Grebbestad has been inhabited for a long time. Next to Grebbestad there are several ancient monuments, such as Greby burial ground from the Iron Age, an ancient castle and a stone labyrinth. Grebbestad first appears in historical sources in the early seventeenth century. Pehr Kalm visited Grebbestad in the eighteenth century and met a population of beach dwellers, who he believed were doing quite well. During the nineteenth century, society developed and industries such as trade, shipping, canning and fishing took over. Grain and timber were shipped out. In 1858 there were seven freighters in the community and sometime around 1870 a canning factory started up at Stöberget. In the last decade of the nineteenth century, the stone industry began, with several stonecutters moving in, including some from Blekinge. Nowadays, these industries have played out their role and it is instead tourism that provides the community with its main income. Grebbestad became a seaside resort in 1844, when mud cures were a speciality because the mud in the sea bay was considered to be health-giving. Grebbestad had both cold and hot baths

during this period. The cold bathhouse, which was demolished in 1974, was the longest preserved. The site of this was the beach below Grebbestad's campsite, at the southern entrance to the village.

Example 2
Grebbestad is a small community where people have lived for a long time. Around the village there are several ancient monuments that have been preserved and the first time the village is mentioned in historical sources is in the early seventeenth century. In the eighteenth century, Grebbestad is visited by a man named Pehr Kalm and what he encounters is a group of beachcombers, who, according to him, look like they are doing quite well. In the next century, the seaside resort is characterised by trade such as fishing, shipping and canning, and later also by stonemasonry when many of the stonemasons moved in from Blekinge. So what does it look like today? Grebbestad lives mainly on tourism and Grebbestad became a seaside resort as early as 1844, which is still the case today.

Copyright and Creative Commons

Copyright (©) and copyright are synonyms. It refers to the right to own and use published material, which means that you have the right to control what you produce. Creative Commons works as a licensing system where permission is given to use what others have produced provided the author is acknowledged for what he/she has done and is mentioned, for example, in a text or under an image. It is important to work with copyright in schools, we need to teach students to find materials and images they are allowed to use freely (Löfving, 2013, p. 129).

It is not allowed to take images, texts and films produced by others; this must be cleared with the copyright holder. You therefore need permission from the copyright holder to use the image for your own purposes, such as blog posts, Facebook or other social media. Otherwise, you are guilty of image theft. Copyright is something that should be given more attention in schools, as students should learn to understand the meaning of copyright and the obligations it entails. Today, it is common for students to download images from the Internet and use them in their school work, and it should be pointed out that many of the images and similar material found online are protected material that cannot be used or distributed by anyone else.

Talk to students about which images can be used and how image search can be carried out to see if an image has ended up in a different place than where it was originally published. For example, a famous Swedish blogger posted a picture of

himself, taken by a photographer, on his private blog. The photographer was never consulted and the blogger was liable for compensation. Instead, if you want to download an image to look at it, you don't have to ask permission, but re-posting it is not allowed. However, be aware that there are sites that allow images to be used in their own contexts, and students should be aware of this too. An example of such a site is pixabay.com. Talk to students about the feeling they would have if someone took a story they had written and this person said that they were the author. Then compare it to taking a picture from the internet and republishing it, as your own material. If I can't take the text, maybe I can't take the picture either. Teach students that a basic rule can be that they have the same rights and responsibilities online as they do in real life. You can't go and take a photo from your neighbour's family album, in the same way you can't take a picture online that someone else owns the rights to.

Lesson Tips—Copyright

The lesson tips on copyright involve pairing works with authors, then working with blogs where students themselves are encouraged to ask the copyright holder if they can use a specific image, and finally discussing celebrity and paparazzo photographers.

Ages 6 to 12 Working with Copyright

Image search (see the chapter "Images and films—what I see, I see, right?", p. 150) and copyright go somewhat hand in hand. For example, with the youngest children, you could make games where pupils can match works with authors, such as a painting-artist, a book-author, a drawing made by a pupil-student in question, and so on. The aim is to understand that there is a person who owns the rights to the material they have produced.

Starting different blogs with students is another way to work with copyright, be it a class blog, a book blog, a sports blog or something else entirely. It forces students to think about what images they want in their blog posts and that they have to ask the copyright holder for permission to use the image. Another important aspect is what settings can be made in the blog to control what outsiders can comment on, i.e. what privacy settings should apply. It is important that you, as an adult, take on a guiding role and act as an administrator in such a blogging context. With younger pupils, the discussion can touch on the use of images but for Years 4–6 source reference should be included.

When we read a text, it takes longer than when we see a picture. Have middle school students think about how many pictures they are "exposed" to in a day and when in the day the first picture appears, for example when the student turns on the phone and has a new "snap." Images whiz by faster and to a greater extent than text does. What does that do to us? The importance of then being source-critical about what appears becomes all the greater.

Ages 13 to 18 Working with Copyright

With older students, it is possible to discuss candid photography, paparazzi pictures and also to bring this into some kind of ethical and moral discussion. Let students make their own covers for school projects. These can be done on the computer which means they need pictures for their assignment. How do they go about it? Have students make the cover before discussing copyright and the right to own their image. Frame some questions where pupils have to retell how they made their cover.

The Harvard System

A common question from older students who have acquired the ability to source is how they can refer to already established knowledge. This is a perfectly reasonable question to ask when students are well advanced in their source referencing. It is then important to talk to students about the fact that commonly known knowledge does not need to be referenced. Another consideration that recurs with students is whether they need to refer to every source (that says the same thing) that they find. No, but their job will be to try to get as close to the original source as possible in order to verify credibility.

When it comes to secondary school students, it is time to introduce different reference systems and they are usually divided into two groups, the Harvard system (parenthesis system) and the Oxford system (footnote system). This is something that secondary schools work with more frequently, but an introduction already in secondary school may be appropriate if the group of pupils is ready. Here I highlight the Harvard system as many secondary schools and universities recommend pupils and students to use this type of reference system. The Harvard system is built around referencing by ranking author-year or name-year and this is done in parentheses in running text. In this chapter the focus is on how the Harvard system is used for internet sources and how referencing these sources works, but the system also includes being able to reference articles, books and other sources.

Lesson Tips—Reference System

For older students, teachers should have briefings on reference marks and referencing systems. Below are tips on how you can work with referencing in school.

Ages 13 to 18 Working with Reference Systems in Schools

By introducing the Harvard system in secondary school, and aiming for students to recognise it, they will have a good foundation for secondary school where the Harvard system is often used even more. Discussions about what the word "plagiarism" means and what happens if it is done in a piece of work should also be held with both secondary and high school students, as well as reviewing various referential markers such as "assert," "claim," "mean," "underline" and similar expressions and exploring what it means to plagiarise at the secondary and/or high

school level. It is sometimes possible to click through a secondary school or university website to find out what constitutes plagiarism. Have students work on reference marks by making their own suggestions and coming up with synonyms. When giving quotations, these must be precise; you cannot use quotation marks and court information, if it is a quotation it must be verbatim. Also, get students used to using the Harvard system in all assignments where text is due. Work extensively with peer feedback, i.e. having students look at each other's texts in order to proofread particular references and how they were written.

News Consumption

If students use a newspaper article, the author of the article falls under certain laws and rules when it comes time to publish. These include the Freedom of the Press Act and the Basic Law on Freedom of Expression, as well as press rules and considerations for interested parties. In practice, things that could harm private individuals are removed, or things that are not relevant in the context, both sources and texts.

Good news journalism is a process of verification, both of what we know before but also of a plausibility about what is new. Different types of sources have different degrees of credibility and in a newspaper (both online and in real life), for example, there are different types of text: news item, news article, report, chronicle, blog, review, opinion piece and so on. Working with different types of texts is something that is clearly stated in the curriculum for primary schools (Lgr11), but how can this be related to how one type of text is more or less credible than another? Is an oral source more or less credible than a written one? Does it make any difference to compare an old news article with an old factual text?

Whether a text is credible or not depends on the sender and the context of the text. For example: why does the news item "An old lady for a rat" not attract as much attention as "A rat for an old lady"? News is also geographically more interesting if what is happening is closer to us. Why is this? Both verbal and visual sources can mean the same thing, but here the aim is instead to allow students to gain a clarity on what news valuation and news consumption mean.

What Will Be News?

Why is a news story a news story? According to the Swedish Media Council, a news story should contain the following points to become a news story: proximity, deviation, negative event, that many people are involved in the event and that a number of people also experience consequences from the event, that an event can be followed over time, that famous people are involved and that there is footage. Everything that happens in the newspaper—in print and online—has a responsible editor behind it; with that said there is a certain security that you as a reader have a clear addressee who stands behind the newspaper itself, a mark of quality.

Newspapers follow a set of rules and are controlled, this is different from what the general public can put out. Newspapers are governed by an industry code of ethics that protects privacy and does not single people out. According to Jonas Johansson, editor-in-chief of the local newspaper *STO-tidningen* (Stenungsund, Tjörn, Orust), newspaper houses are losing credibility today. He believes that the media are withholding things today, partly to satisfy readers' needs and partly to avoid losing readers. News that used to be appreciated by the public can today be replaced by more "dirty" news. How does the human factor, that even a journalist can have his or her preconceptions, affect a text or feature in the news?

When it comes to being critical of different types of news sources, you can work with submitted material, such as opinion pieces. Here, someone else is responsible for what is written, but before it is published, it is read by editors or journalists to see if it is in a good tone. A person cannot write in and say that the neighbour has nailed copper nails in a tree, for example. Even if that were true, it would fall under defamation of another person. When it comes to posts, it is legitimate to be a little sharper in your comments against elected officials than private citizens. Some submissions have signatures, others are anonymous—partly because the writer may fear reprisals. The aim is to get as close to the primary source as possible to confirm or deny information.

Lesson Tips—News Consumption

Here you will find lesson ideas on how children and pupils can get to know newspapers, but also tools for older pupils to be investigative journalists.

Ages 6 to 12 Making your Own Newspaper

Younger children can look at newspapers and cut out different lengths of text and then talk about how a newspaper has several different parts. They can make their own newspaper, interviewing teachers at school, for example, and work on writing about things that happen at an extremely local level, such as an upcoming Christmas celebration and its programme. It is also useful to go through HOW pupils can see when an article or post has been published.

Also review the meaning of words such as "update" and "publish" and show where these words can be found on a website. Let students choose some websites themselves and then answer the questions "When was the post/article/fact published?" and "When was it last updated?" Another task could be to give students a series of prepared news stories and then have them report on which ones are true/false and how they arrived at this conclusion.

Ages 13 to 18 Media

Talk to older students about how news agencies, such as Reuters and TT, work, and whether there is a danger that news sometimes comes out a bit too quickly. Then discuss examples of some "fast" news stories that the media world has covered, starting by giving students some current affairs examples.

One way to work on the media world with older students is by discussing advertising—and credibility around advertising. Also address advertising via bloggers

and how credible that form of advertising is as it is usually about making money from products that are blogged about. Is the excellence of the product particularly credible? See if students can find some examples of this. Reading out some news stories to students, true and untrue, is also a way of working with the media world. Students can prepare by asking different questions and then come up with which news was true and which you as a teacher made up. They usually find this a lot of fun as there is a bit of a competitive feeling about the moment.

Another tip is to let students be investigative journalists on current affairs. Students can read a Swedish news story and then obtain the original source in order to confirm—or deny—the information spread by the media. This can be done as a project over time and then presented in small groups, or as a whole class. Furthermore, students can compare different newspapers around the world and consider why some news is bigger in other countries than it is here in Sweden.

One task for older students is to ask them to work on a fictional text, without telling them that it is fictional. You can prepare the text beforehand and then read it aloud to the pupils. See the example below:

Chips Can Cause Cancer
According to a brand new study, ordinary potato chips can cause cancer. It has emerged that an increasing number of companies producing crisps are using toxic chemicals that can be harmful in large quantities. Some experts claim that this contamination by toxic chemicals can cause cancer in both animals and humans. A credible source living in Småland has told us that she has been eating potato chips for years and now has cancer, she is sure that it is because of the potato chips.

Then let students think about where in the text above they should be critical of sources. Can they find one place or more? Then discuss the reference "according to a recent survey." How recent? Who did it? What was the purpose of the survey and how was it conducted? It also says "more and more companies"; which companies are they? What does increasing mean? Similarly, with "Some experts claim …", who are these experts? Are there experts who claim the opposite? "A credible source," who is that? And how credible is it without names and other information? Have students discuss with each other in small groups and then work as a whole class on what they have come up with.

Credibility of News

Original source, primary source and first-hand source are the same thing, second-hand source and secondary source are also the same thing. These are hardly opposed to each other unless they have differing views. The secondary source is what the primary source says, for example person A has said this—and now you are saying it to someone else. To assess the credibility of what has been said,

you need to get hold of person A. The bigger the story, the more people you want to talk to in order to get as many first-hand sources as possible to verify the information. Strachal and Thurén argue that we should not resign ourselves to the fact that a summary or an abstract should sum up what we want to be said, but it is of utmost importance to get as close to the original source as possible (2011, p. 27).

To make sure what is true or false, it is beneficial to find different perspectives and ask different people who can also answer in different ways. Be careful not to fall prey to rumours. The primary source is someone who has seen something or witnessed something, for example someone who has seen a robbery. A secondary source is someone who has heard something and then passes the information on. The primary source may be more credible, but not necessarily so.

What is the impact of different *types* of sources on credibility? Depending on how credible the source is, it doesn't matter if it is written, spoken or visual. However, if different types of sources are combined, for example an oral and a visual one, it becomes even more credible. Sometimes the printed source is not needed, e.g. person A has killed person B—but no one is missing. Often another player is needed to make it work (for example, the municipality or the police). How interesting is the news to the public? Usually news based on a conviction or a lawsuit is of relatively high public interest and then it is something the newspaper in many cases writes about; here there is also a possibility of follow-up and this also weighs heavily for public interest.

Lesson Tips—Working with the Credibility of Different Sources

The lesson tips focus on the types of sources some news stories use when a story becomes news and how this affects the credibility of the story.

Ages 6 to 12 Credibility of Different Sources

For grades 4–6, different types of sources can be introduced, such as first-hand and second-hand sources, and a discussion around these. Address the fact that first-hand sources can also be called primary sources and second-hand sources can be called secondary sources. Also, original source is another term for first-hand source and as far as students are able, this is the type of source they should get as close to as possible when working on source criticism. How the choice is made regarding the naming of what is being talked about is not so important, but the essence lies in students understanding the difference. An example is when my students were interviewed by a journalist about our source criticism topic at school. After a few days, the article was published in the newspaper with a number of inaccuracies. We then had a clear basis for discussing how easy it is to get things wrong and that the article was a second-hand source while the students were the first-hand source. A second-hand source refers to a first-hand source, in this case the journalist who interviewed the students referred to what they told us. There was also room for some interpretation, which can also lead to pure errors. A first-hand source can also be biased or tendentious. A third-hand source, on the other hand, refers to a second-hand source; it goes without saying that the further you get from

the original source, the less credible the information becomes (see the example of the whispering game exercise in the chapter "Conspiracies and alternative facts," p. 159).

Ages 13 to 18 Credibility of Different Sources

Older students should be able to briefly explain the difference between first-hand and second-hand sources and how they arrived at that answer. Where possible, students can try to obtain a first-hand source, but this can be difficult in the case of historical sources (see more on this in the chapter "Source criticism in multiple curricula/multi-subjects," p. 168).

Objective/Subjective Source

How can the same phenomenon be perceived in so many different ways? How can one and the same event be mixed and matched until it suits its reader/follower? If two independent sources, i.e. one unrelated to the other, say the same thing, credibility increases. To examine the credibility of a source, the following questions can be used: is it the author's own thoughts, facts? If there are several different sources leaning one way or the other politically, what does that do to the reliability of the information being reported? You can also compare the same news, but from different media. In what ways does the news differ? Go back to the different media you chose, are they politically biased? Is it visible in the text? It can be interesting to choose sources that have different perspectives to broaden the argument. For example, a crime may be true, but if the totality would say something else, the news will be wrong. For example, if we say that people who grew up on the west coast are not swimmers, and this is the only news that goes out, then individually it will be true—but in a totality it will be false.

Lesson Tip—Objective/Subjective Source

Here are lesson ideas on how to let students research sources, preferably by comparing and delving into the sifting and choices made.

Ages 6 to 12 Objective/Subjective Source

Look in your news feed on social media for example; can you find the same news on another site? Let students test this for themselves and then compare their answers with each other and see if they can find any patterns around the results. In the next stage, students can think about whether they found places where the news was credible but the sender was not, or, conversely, the sender seemed credible but the news was not.

Have students look for conflicting sources, i.e. sources that say different things about the same information. What is the point of comparing different sources? Students might get information about a person who was in prison in a certain year while another source claims that the person was born in the same year.

Ages 13 to 18 Objective/Subjective Source

Here you can work on questions such as "How is Donald Trump portrayed in the media?", "How are beggars portrayed in the media?" or "How is Jimmie Åkesson portrayed in the media?" Produce three sources: one where the person/event is portrayed positively, one negatively and one neutrally. Once you have found three different sources that show three different approaches, look at the URL of the sources, their "About" button, their background, etc. Furthermore, you can discuss whether there is a reason why a source is positive. If so, what is the source? Is there a reason why the source is negative? If so, what is the source? Here it might be appropriate to look at different types of websites on the same topic, for example animal testing, and the sources could be a blog on animal testing, the organisation Animal Rights and the Faculty of Medicine at Lund University. All three write about animal testing but have different approaches. Talk to students about the implications for credibility.

Together with older pupils, you can look at the proximity principle; what happens closer is usually also easier to grasp. Let students follow the news in the world, what does it look like? Another suggestion is to look at Martin Schibbye and Johan Persson and the news reporting they did when they were suddenly shot at on the border between Somalia and Ethiopia.

Wikipedia as a Source of Information

"Wiki" means fast and Wikipedia provides fast information with an unstated purpose that the information can be changed and improved over time. Students need to be aware that it is possible to add and remove information on Wikipedia, which in turn means that anyone who wants to be an editor can be one. Wikipedia is therefore the free encyclopaedia that anyone can edit. But how does Wikipedia work as a source of information? In this section, readers will find a series of examples of how to use Wikipedia from a source-critical perspective. It also provides information on how Wikipedia works as a source and how it differs from other encyclopaedias.

How Does Wikipedia Work?

Wikipedia is a living encyclopaedia that is constantly being renewed and probably improved. The public—and school—perception of using Wikipedia has changed over time: from being largely a forbidden reference to becoming an established source of information. There is no doubt that Wikipedia is part of social media, according to Löfving (2013, p. 115). A concern that sometimes arises in relation to Wikipedia as a source is based on the fact that many people can contribute content—but this is also precisely what makes Wikipedia a social medium. Another analogy with social media is that Wikipedia is updated frequently and quickly, but it this is not always noticed, unless someone checks the history. Wikipedians, or

moderators, are the people who voluntarily have the task of reviewing information on Wikipedia (Löfving, 2013, p. 115). Lina Sundahl Djerf writes in her article "Wikipedians are becoming more common" (Sydsvenskan, 3 August 2014) that the typical Wikipedian is a Western male who is college educated and 22–29 years old.

Löfving refers to a previous study which found that Wikipedia contained an average of four errors per article, while the highly respected Encyclopedia Britannica's web-based encyclopedia contained an average of three errors per article (Löfving, 2013, p. 127). According to the Swedish Media Council, no comparisons have been made between Wikipedia and other encyclopaedias when it comes to reliability, however, what is pointed out is that on Wikipedia there are articles that are only started and that this must be taken into account when referring to the sources of these articles. On the other hand, some articles may be more developed than in an encyclopaedia.

Please note that by contributing to Wikipedia, you agree to the release of your contribution under the Creative Commons Attribution-Share Alike 3.0 license. This means, among other things, that you agree that your text can be edited or copied by anyone. You are also responsible for ensuring that your contribution does not infringe copyright and that all information in your contribution is verifiable.[1]

The person who is responsible for putting information on Wikipedia, or the person who firmly asserts that a certain type of information should remain, is also the person who is responsible for basing this on other sources and that it does not violate copyright law. Other ways in which the public helps to verify credibility is by commenting, while reading, on information that, for example, lacks sources—or needs to be reinforced with more sources. This is something that you as a user agree to by contributing to Wikipedia and more about this can be found on Wikipedia's own page. Wikipedia's credibility has thus increased in recent years and it is more legitimate to use Wikipedia in a school context than it used to be. Since anyone can edit and question the credibility of the articles, this means that Wikipedia has more readers than writers, which in turn results in the writer being exposed to many people's opinions and thoughts.

The aim of Wikisource is to make older source texts (hence the name source) such as books, newspapers and archival documents readable, searchable and citable. It uses the same wiki technology as Wikipedia, which means that everyone can help edit and extend the content of the web pages. The difference is that Wikipedia aims to create an encyclopaedia with educational explanations of all human knowledge, while Wikisource aims to reproduce as accurately as possible an original printed text.[2]

[1] https://sv.wikipedia.org/wiki/MediaWiki:Wikimedia-copyrightwarning.
[2] https://sv.wikisource.org/wiki/Wikisource:Välkommen.

Lesson Ideas—Working with Wikipedia

Wikipedia was a reference I was never allowed to use in my schoolwork, but things are different today. Below are lesson plans where you can teach students more about how Wikipedia is structured and perhaps even increase their understanding of why Wikipedia is now a trusted reference.

Ages 6 to 12 Using Wikipedia as a Source of Information

A lesson on Wikipedia can begin with two questions for students to consider: "How does Wikipedia work as a source of information?" and "Can anyone write things on Wikipedia?" Have a dialogue with the students about how Wikipedia works and google a Wikipedia article that you can read together. With older pupils, the discussion can instead be deepened by talking about how a Swedish Wikipedia page compares to an English one. "Too little information" is usually the most common argument students mention about why the English version of Wikipedia should be used more widely. Have students look up information, on both Swedish and English Wikipedia, about daffodils (*narcissus*) and then in groups they can think about what makes the different answers different. Why does it look the way it does? Draw students' attention to the fact that some Wikipedia text can be difficult to read, especially when the text contains many words that are blue and send you to another Wikipedia page, making it easy to get lost. Have a briefing with students on how to do this. Also talk about how to double-check what Wikipedia writes by checking the content against other sources.

Ages 6 to 12 View the Encyclopedia Development

Show students an encyclopaedia where you look up a specific keyword together. Then do the same on Wikipedia and let the students compare the texts with each other. Is there a difference in scope? Content? How can you work critically on the basis of this? Is there an author? Sources? Talk about what time has done to the development of assimilating information, discuss advantages/disadvantages and what students think might happen in the future.

Ages 13 to 18 Using Wikipedia as a Source of Information

In discussions about source criticism, you can show students how easy it is to use Wikipedia as a source of information, but also how quickly an article can be changed. I did an exercise with my students where we added an extra paragraph to a text. It originally said "The church was consecrated in 1862." and we wrote together "The church was consecrated in 1862…" The change was published but it took no more than a minute before it had been changed back as the paragraph was deliberately misplaced in the text. The students found it exciting and reacted to how quickly the change was noticed and the article reverted to its original version. We continued the exercise and made another addition, but this time in the form of a description of the small community of Grebbestad. The original text said "It is a very popular seaside resort" while we wrote "It is a very popular seaside resort and the small community absolutely explodes in the summer." The change was

highlighted in blue but had to stay longer this time, however it didn't take more than a day before our addition was also gone. On Wikipedia's own page it says.

In addition to the requirement for credibility, it is an advantage if the sources used are reasonably accessible. A statement can hardly be considered verified if only the person who added the source has access to it. It is always good to tell where information comes from, and the requirements for reliability vary according to the nature of the information. Also the source references, like other information, can be changed and improved as this is a wiki. An oral source from an initiated source is probably better than a written one with flaws as a basis for article writing, but is more difficult to verify. If, after normal source checking, the information is still questioned, it may be removed (and hopefully replaced with more accurate information[3]).

Another task is to ask students to think about how they can find previous changes to an article on Wikipedia and compare the different changes. Sometimes it is possible to see how a correction to a pure error can be quickly changed, for example as above with when the church was consecrated, though let the article be seen on a projector screen. You can choose to add new information and let students see how quickly the change eventually reverts back to the original position.

You can also discuss with students what happens when pages are so easily manipulated. Start by pointing out inaccuracies and then have students look for inaccuracies themselves, or have students hold information that is missing from Wikipedia. Take so-called "screenshots" (digital images of what is on the screen at any given time) of before-and-after images and then have students discuss questions such as "How can you find previous changes to the page you have chosen to focus on?", "How can you think critically about sources when pages can be so easily manipulated?" and "What are the advantages and disadvantages of Wikipedia?".

7-Go Wikipedia as Project Work

Older students can work with Wikipedia more as a project, for example by finding an article that is not very informative to begin with and working on adding information. It could also be that students make up something to write about. How easy is it to manipulate an article? Write down a series of questions such as: how long does it take for someone to edit the information? What are the edits about? Are they mostly linguistic mistakes? Could it be that some corrections are automated? Maybe you can find a topic that is not written about much and act as Wikipedians for a week?

[3] https://sv.wikipedia.org/wiki/Wikipedia:Verifierbarhet.

Images and Films—What I See, I See, Right?

My six-year-old daughter and I are out picking flowers on an early summer's day, and she picks up a flower which I'm unsure is a protected species or not. We talk about what "protected" means and I say we'll have to look the flower up online. She looks at me for a long time and replies after a while: "But mum, you can mess around on the internet." It was my first source-critical conversation with my daughter and I was both surprised and happy that, at the age of six, she had understood that not everything that appears online has to be true.

How do we deal with what children and young people encounter online today? Do I really see what I see? How does image search work? If children understand how a film or an image can be edited, it is also easier to understand that others can do just that. Young people today are exposed to a huge flow of information that is difficult to control. This makes our work as teachers and adults all the more important. So how are we affected by images? Do they have to be true or is it permissible to cheat with images? Is it something we have always done? This part is about students learning to understand their own role as publicists and what is involved in managing images.

YouTube as an Information Channel

Young people often get stuck in channels such as YouTube. The danger of such a channel is that it is so associative that it can quickly change content. Views can go from an Idol audition to a child who then sits and cries in the schoolyard. The so-called "safe search" is a setting that acts as a barrier to both content and links that appear inappropriate in search results. The safe search filter can be set to allow you to adjust how strictly the content is regulated. Safe search can also be disabled at any time. But the viewer can still end up anywhere, even if an adult or teacher has set the blocks. This is true even if you are watching a short clip and get a list of, according to YouTube, related suggestions. As an adult, teacher and/or parent, you should therefore often discuss with young people which images and YouTube clips they have seen. In such situations, point out to the students that their feelings are allowed to be present, and if there are any concerns in the discussions to pass them on to the "right" person if necessary, such as the school nurse. Start from what the children are looking at and don't be judgmental, they see what they see regardless of what you say.

Lesson Tips—Working with YouTube

Using YouTube in a classroom context is usually appreciated by the students; it is a familiar world for most of them. Showing commercials and discussing truths also tends to be a winning concept that suits most ages.

Ages 6 to 12 YouTube

Talk to children about the contexts in which they use YouTube. Talk about how easy it is to be fooled by what they see and that it is very easy to change images with different programs. Pupils can start their own YouTube channel where they can work with editing software to find out how easy it is to be fooled by images. Is everything true just because it's spread online and got a thumbs up on social media? Pupils can also interview each other—and adults at school—about how they use YouTube.

Ages 13 to 18 YouTube

Here you can work with different commercials and discuss what is true/false, for example the "epic split" made by actor Jean-Claude Van Damme in a commercial for Volvo Trucks. In the film, Van Damme goes into a split a few metres above the ground between two reversing trucks. Students can consider whether what they see is true and why Volvo chose to make the commercial in this way.

Zach King, an American YouTuber, has a lot of magical clips on YouTube that you can use to discuss in class whether what you see is true or not and how he goes about making his clips. Also, let students come up with their own suggestions for YouTubers they follow, but the focus should be "Is this true?".

It is also a good idea to let students present what they have worked on and learned, preferably through film (if possible) or other means, and then preferably to other classes in the school so that the dissemination is as wide as possible. It could be that younger students present to older ones and vice versa. The presentations can take different forms, such as students making slides, recording podcasts, making films, presentations, blogs and so on. Also discuss with students that YouTube (as well as Google and Facebook) is prohibited by law in some parts of the world, including China. Let students think about why this is so. What negative and positive effects on, for example, freedom of expression can YouTube contribute to?

Lesson Tips—Working with Images

Working with images in the context of source criticism is usually appreciated by students. Below are suggestions for how to do this, including through viewport images, and how to manipulate and cheat with images. These exercises are also suitable for children and students of all ages.

Ages 6 to 12 Publication of Images

You can discuss what you can and can't do when it comes to images online. Can I take your picture without asking permission? Am I allowed to post pictures of you anyway? Is it okay for my parents to post pictures of me on Facebook, for example? Can I say no?

Let students write their own questions about image publishing. They can then interview their parents or other people close to them to see what they know about copyright and image publishing. Then have students report their answers and summarise what they have learned from the work. Another angle is to investigate the

situation at school. Are pupils allowed to give their consent to publication on the internet or other forums? Is this something that parents decide or is the voice of the children equally important when it comes to publishing on the internet or pictures in other school contexts?

Ages 6 to 12 Interpreting Pictures

Children can practise their ability to interpret images as early as preschool. Younger children should be given the opportunity to interpret different images by thinking in terms of their own preconceptions. You can reflect on the images with the children. Think about what they actually see in the picture, what the picture is telling the children. Is it possible to see the reality in the picture? Can the images deceive us? This can challenge children to understand the relationship between what they see and what the picture shows. The preschool curriculum (Lpfö 98, rev. 2010, p. 10) stresses that preschool should strive for each child to "develop an interest in images, texts and different media, as well as their ability to use, interpret and talk about them." One way of approaching this could be through working with so-called "looking pictures." Do this: you have a large picture but using, for example, a passe-partout, you hide all but a small part, no bigger than a postage stamp in size. Let students think about what they see. Then show a completely different part of the picture and ask the same question. After a moment's reflection, you can show the whole picture; did it match what the students thought they saw? How can this be adopted in other situations? Let the students think about it for a while and then discuss it together.

You can also let the youngest children play with scepticism about pictures. Take out a blind and let one of the children hide behind it. The other children close their eyes and after a while another child peeks out. How did this happen? The youngest children can also work with iPads and talk about what they see on their iPad. The children in preschool can also produce their own videos, which you can then discuss based on the didactic questions in the chapter "Making critical reasoning about sources" (p. 113).

Ages 6 to 12 Copyright on Images

With younger children, you can let them paint their own pictures. After a certain amount of time, let them swap pictures with each other; for example, everyone hands their picture to the person on their right. They can then continue to paint the same picture and after that the first person gets their picture back. What happens? How do the children react? Discuss this in the group, e.g. what emotions arose, and link this to copyright, which will be the next part (it was introduced in more detail in the chapter "Referring—plagiarising," p. 122). You may want to start by having students think about when they use images on the internet and in which forums this is done.

Then have a discussion about what they think they can/can't do with pictures, preparing a series of questions for students to think about individually before talking about it as a whole class. Pupils can search for an image themselves to find out who owns the image.

Ages 6 to 12 Cheating with Pictures

Furthermore, students can learn how to cheat with pictures. Discuss with students what images we can trust, how we can know what is true and more. Pupils can then cheat with pictures themselves, using newspapers, scissors and glue, and make photo montages. As a teacher, you can cut out the head of one person and glue it onto another; in a different context, this should get students thinking critically about images. If they learn to retouch images, they will also learn that images can be retouched. You could also cut out, for example, a picture of a person sitting high up on a mountain, next to which is a (pasted) animal. Be clear that you have manipulated the image but ask students what they think you have changed from the original image. Also let them think about what they might have been changed before you manipulate the picture. Furthermore, they can then make their own "picture cheats" where they go around and look at each other's pictures afterwards to think about what has changed. When talking about altering a picture, you can also discuss whether we can be sure that a picture is "real" and what the person who posted the picture is thinking. What does the person want to say with their picture? This could in turn lead to a fake image exhibition where other children and young people in the school develop their critical approach to images they are exposed to.

Ages 13 to 18 Publication of Images

Students need to know that there are laws that protect us when it comes to personal data. The Personal Data Act (PUL) is there to protect the privacy of individuals and the General Data Protection Regulation (GDPR) is there to protect the fundamental rights and freedoms of individuals, focusing on their right to the protection of personal data. When it comes to images, things are different. When you upload an image it is stored by Google for the purpose of improving products and services. This is something that can also be a basis for discussion with older students. How does it work on Facebook, Instagram and other platforms? Who owns the rights to the images you upload? As a teacher, you need to have a dialogue with students about the so-called "digital footprints" they leave behind. These prints are likely to remain on the internet and, with a bit of bad luck, they may be used in other contexts than the ones first intended. Before publishing a picture of themselves, let students consider a few questions: can I still stand for this picture in ten, twenty, thirty years' time? Is there anything in the background that is not so appropriate? How might I be perceived by others who see the picture? When discussing images on the internet, it is a good idea to include a concrete and topical example; it is often easier for pupils to relate to the subject if the recognition factor is relatively high. You can later do image searches together in the classroom. For example, it could be something you are all familiar with, such as the school the pupils attend. Think about how many image hits you get and what kind of images come up. Does it say anything about the school? In what contexts does the image of the school appear? Is it a fair image of the school shown through the pictures?

Ages 13 to 18 Tolka Pictures

Working with images in the classroom can also be a way for the pupil to evoke emWotions, thus creating a new forum for discussion. For older pupils, working on a specific topic may be an option, such as how animals are portrayed in the media. You can prepare questions to serve as a basis for discussion. Then select a range of newspapers from the internet and from different media, such as daily newspapers, newspapers from different animal rights organisations, weekly newspapers or gossip magazines. The question can then change depending on what the students are interested in.

For high school students, it is appropriate to address the discussion of edited images, for example with a racist agenda, as a result of various terrorist attacks in the world. Let students think about why this is a common phenomenon and who are the winners/losers of such image montage. Feel free to bring up some examples and discuss what you see. For a more general assignment on montage, the keyword could be "media deception" and you could have a discussion about what you see. Students can also look for images themselves to print out and discuss. Let students think about why it looks one way but is actually something completely different. What is in it for the media? Have students work with articles that are intended to provoke strong reactions, such as images taken from a completely different context than the one the text focuses on, edited images that have been circulating in the media as pure inaccuracies.

Ages 13 to 18 Copyright on Images and Digital Footprints

What can happen if you send a naked picture? Will it disappear? What happens to that picture in 25 years? What happens when you're applying for your first job and employers image Google your name? As a teacher, you can discuss these issues with older students, talking about how things online very rarely disappear and that students need to stand up for what they do there too.

Ages 13 to 18 Image Cheating and Image Search

When you want to work on image cheating with older students, it is useful to talk about images in the media and the ideals that surround us. The next step is to get into retouched images, how we can make minor corrections to get the image "right" or how we can completely redesign an image to make it more appealing to us. Talk about gender and discuss, for example, a picture of Superman versus a Barbie picture. What do students see and what conclusions can they draw? Then move on to non-animated images to look at different cases of retouching.

Teach students to image search by doing it together first and then letting students do it on their own. The aim of working with image search is to help students understand that they can see in which other forums the image has been posted. They can also see the image in other sizes and look at similar images. By working with image search, you can have discussions about whether the image has been edited and, if so, for what purpose it has been edited. Is it for entertainment or to spread false information? Let students choose their own images to search for, pointing out that it is more accurate if the student chooses a well-known image than a family portrait.

In the same way that you go through how to search images, you can also search videos. In addition, get students thinking about trick filming. If you like, show examples from YouTube where you first ask students if what they see is true. Let them think about who made the film, why it was made, when it was made and why someone would want to share it. Then let the students look for videos that they think might be trick films. After that, you can have a film screening in the classroom. Students who want to can also make trick films themselves. For high school students, the discussion of photographers' goals to make an impact with their images may be appropriate.

Conspiracies and Alternative Facts

Credibility is at the heart of source criticism and something that touches all parts of this book. Always ask the question "Is this plausible?" Internet sources update and age, but they are usually still in the system. Look carefully at when the source was published or last updated to make a judgement on its content. How can you think about credibility? How can you find out if the information is good but the source is too old? By the way, how do you know when a source is too old? It is not the quantity that determines credibility, but how we use new strategies and approaches to the media and information flows that circle around us. This section includes clickbait, conspiracy theories, doomsday theories, fake news and internet trolls.

Conspiracy and Doomsday Theories

Conspiracy theories are beliefs that reality looks different from how we see it and that there is a plan/conspiracy, usually secret, behind it. Andreas Ekström, journalist at Sydsvenskan, in an interview on Swedish Radio on 10 January 2017, echoes Maja Essebo's assertion that conspiracy theories respond to a deep human need where it is the story we seek, the excitement and the explanation we are looking for,[4,5]. It is important to focus on conspiracy theories in school, as these theories are in every classroom and we need to have a dialogue about them. Alternative facts and "fake news" (see later in the chapter) go hand in hand with conspiracy theories, it is just a modern take on the same phenomenon. Conspiracy theories also go hand in hand with doomsday theories and there is a lot to take from the internet here, but it is aimed more at older students.

[4] http://sverigesradio.se/sida/avsnitt/846451?programid=503 on 10 January 2017.
[5] https://statensmedierad.se/download/18.1957a5a615000172419309d2/1443530143565/Superundersokarna.pdf.

Lesson Tips—Conspiracy and Doomsday Theories

If you choose to work with conspiracy theories in the classroom, you need to start with the truth and scientific facts before discussing the conspiracy theory itself with your students. How to do this is explained in the lesson tips that follow.

Ages 6 to 12 Working with Conspiracy Theories

As I said, never start with the conspiracy theory, always start with the truth. For example, you can talk to students about how jet streaks are formed in the sky from airplanes and the technical explanation for it (without getting too technical). In the next stage, you tell them that there is a conspiracy theory, pointing out that it is not true, that what is coming out are chemicals that are going to harm us. There also needs to be a conclusion and students can work this out for themselves: "The conspiracy theory says this because…" The most common conspiracy theories, according to the Expo Foundation (2017, pp. 26–29), include that 9/11 was an inside job, fluoride poisons us, the moon landing never happened, jet streams poison the earth, the Holocaust is a hoax and that the pharmaceutical industry wants to keep people sick.

Furthermore, the discussion about how countries make things up about each other can be highlighted and that this is spread further, meaning that in some countries the truth may never be discovered. There are conspiracy theories all over the world, and it is important that we talk about them and why so many people believe in these theories.

Ages 13 to 18 Working with Conspiracy and Doomsday Theories

For example, you could work on the story of Anastasia and Walt Disney, which is an old conspiracy theory. Read through a retelling of what happened to Anastasia. Give the historical truth, that, as far as we know, she was murdered as a teenager. Have students watch the film and then think about what a conspiracy is and how this is an example. Look at real conspiracies that have existed and doomsday theories that have not happened.

Older students can think about what a conspiracy really is. Have students write down their thoughts individually on a piece of paper that will not be collected. Then discuss different conspiracy theories with the students and let them think about why so many people believe in them. Then have students search online and choose a theory to retell to a peer. Read up on the classic example of the rat in the pizza and see if students have any modern versions that you can look at together to see if they have been in similar forms in the past. Wandering tales change and adapt to the times, what does it look like today? As a final part of the assignment on conspiracy theories, you could create a large board together with student quotes based on conspiracies they believe in or have heard about. It is important that they clarify the theory and talk about what they find remarkable about it. Here students show that they can look at an old concept from a new angle and that conspiracy theories are now called "fake news," something that pervades the whole world.

A deeper way of working with conspiracy theories in a source-critical perspective is to work with a scientific method to approach a kind of truthful picture, such

as in the example with the jet streaks above. The first thing students can do is to note what they see and then think about what it is: "I see white trails in the sky." The second part is to conduct a kind of research into what it might be: "Warm air meets cold and trails form." The third part is a hypothesis, for example, "I think it's a gas." The fourth part will be an experiment, for example, "It's just steam". The fifth part will be the student's results and the sixth will be an analysis of the results, and then a conclusion. Let the students use the method to find out the facts; it could be that "Elvis is alive." Let them go through the steps to prove/disprove the theory.

Doomsday theories have always existed, and in my experience older students have encountered a number of different variants. It is important to discuss the theories with the students and vent their thoughts and concerns. One lesson that worked well for me and my students was when we read an article together about when the earth was predicted to collide with Planet X. The students were then asked to reflect in small groups on the five didactic questions raised in the chapter "Making critical reasoning about sources" (p. 113). A couple of days later, a student came to me and had done further research on the theory and through Google Maps found inaccuracies in the article. As a teacher, you need to give students the tools to want to look further, to arouse the curiosity that makes students themselves choose to work further on something you as a teacher have introduced.

Fake News and Clickbait

Fake news is a concept that is gaining ground in the media and is being used more and more frequently every day. Politicians like to use the term to point out inaccuracies in each other and in information that has been spread. The term fake news also includes news that is used to influence people. However, some believe that the term is overused and will soon disappear altogether, but that remains to be seen.

When we talk about *clickbait* the aim is to attract as many clickers as possible, "You won't believe what happened next!", which has the purpose of making you click further. Often you as a reader are redirected to other pages, where advertisements are the focus, so there is a monetary interest behind it. Which clickbait is most common? How do we know if it's a clickbait or just a catchy headline?

Lesson Tips Fake News and Clickbaits

The lesson ideas below are about getting children and students to be more vigilant in their online use in general, and in the later grades to work more on fake news in particular.

Ages 6 to 12 Working with Fake News and Clickbait in School

Discuss different websites with the students, preparing examples. For example, use the Swedish National Agency for Education's storybook The "super examiners" for children of younger ages. The Supertests are mostly about making pupils

suspicious of what they see online and are a first step towards more vigilant online use. For younger children, this part is about arousing a curiosity that should be questioning rather than technically inclined. Let the children listen to stories and practice asking questions about what they hear; this creates a permissive climate around being curious and daring to ask questions.

Ages 13 to 18 Go Work with Fake News and Clickbait in School

The role of schools is to tell us what we know today is correct, but we will encounter fake news regardless. As long as students have the tools to draw their own conclusions and have their own opinions they are well equipped. Fake news is a concept that took the world by storm in 2017. The term, as well as its meaning, can be debated extensively. Include various statements highlighted in the media and let students reflect on what was said, why, in what forum, the purpose and whether it was true. You may want to google current statements on Twitter and other sites and let students think about how different statements and posts may be perceived by others. You could talk to pupils about troll factories that have had a mission to blackmail and spread fake news in order to generate more clicks and more money.

With high school students, news can be reviewed over a longer period of time, however, it is easiest if it is an actual newspaper and not on the internet. Have students first choose to follow a famous person in the media and then compile where the news comes from and what it is about. Can you see any patterns? Let students try to find international newspapers that write about the same thing.

Another task that can be done with older students is to start from a specific thesis that you can then argue for or against. Let students start writing without looking for information. They should start with what they already know or have heard, and in the next step seek information that reinforces what they knew, but that they have sources to reinforce the argument throughout. Have them find sources that highlight both advantages and disadvantages, and also have students think about whether the sources are first-hand or second-hand and how this affects credibility.

Lesson Tips—Spreading Rumours

By using the classic whispering game, you can create good conditions for further discussions on the theme of rumour spreading; see the lesson tips below.

Ages 6 to 12 Word of Mouth

Together with the students, you can talk about spreading a rumour and link it to what happens to a story that is retold several times, between different people. Then draw the parallel with the internet and what happens to a story that is shared several times, in different forums, and what the consequences might be for the person who might be “exposed” to the story. Feel free to work with stories that change depending on who is telling them. The whispering game is a good example that tends to work to get students to understand what happens to information along the way and how things can be misunderstood by others. Get students thinking about rumour spreading and discuss the dangers of this. For example, consider how a

story might start with a bin in the corridor on fire but in the end someone has understood it to mean that the whole school has burned down. Another exercise that can be done with younger students is to write down a sentence on a piece of paper where one student can draw what they are reading, then the paper is folded and another student writes what they see, a third draws what they read and so on. Afterwards, you can review together what happened, how each person thought along the way and why it turned out the way it did.

For Years 4–6, you could ask students to consider a range of questions for themselves, such as whether they believe things they hear others say and whether, in any case, they have been told that it was not true. Let students give examples of when this has happened, but first let everyone think and write down answers to the questions (if they have them). Go into the discussion about advertising, both TV advertising and advertising that appears on the internet, often on YouTube, and whether the advertising feels targeted to what the pupil wants to watch and whether the urge to buy has kicked in. Then go into depth on all the issues and ask follow-up questions. Use the question "Who benefits from this being shared?" often to make a point. Strachal & Thurén argue that the question "shows how the reliability of a website can be assessed by looking at how the people behind it express themselves. In particular, this applies to inconsistencies and logical contradictions in the text that bring down credibility and may reveal the true values of those behind the website in question" (2011, p. 27).

Ages 13 to 18 Rumour Spreading

Talk about how everyone can make blogs and do a class blog with students to show how easy it is to start one. Write imaginary things and check back after a week to see if what you've written together has stuck. Have students think about questions like "Who reviews a blog post?" Then let students conclude that no one reviews a blog. Get them to understand how unreliable the information on a blog can be and that anyone can write any false thing they want. What can be grounds for shutting down a blog, however, is illegality. Therefore, you should not share things about yourself as this is very difficult to get removed. Here's what it says on Google under policy.

Google search results reflect the content available to the public on the web. Search engines cannot remove content directly from websites, so even if content is removed from Google's search results, it does not disappear from the web. If you want to remove something from the web, it is best to contact the webmaster of the site where the content is located and ask him or her to remove it. In addition, under European data protection law, if you want to request the removal of certain information about you that appears in Google search results, click here. Once the content has been removed and Google has noted the update, the information will no longer appear in Google's search results. If your removal request is urgent, please visit our help page. There you will find more information.[6]

[6] https://www.google.se/policies/faq/.

I think that making up information in order to learn something along the way has been a successful task when the students have been able to try it out. It has been very instructive and the students have been responsible for the learning. Before starting a blog, it may be wise to have a briefing on defamation and libel. It might be a good idea to bring in someone from outside the classroom who knows more about the concepts, such as a police officer or a lawyer. Students can publish what they write, but under the supervision and guidance of the teacher. Give the pupils a task to relate to, for example "The world's smallest living animal." There is a lot of information where the source behind it is missing, which becomes a problem when "truths" are spread. It attracts attention and there is a lot of opinion on the issue, which in turn creates semi-news with many reactions.

Source Criticism in Several Curricula/Single Subjects

In the chapter "Consumption of news" (p. 134) different types of sources are described. Finding an original source, as far as possible, can be difficult in subjects such as religion, science and history. Who should be used as a source in religion? Who knows the most about themselves and can openly answer for the way things are? How is a truth proven in religion? Geographical sources are mostly about how a map can be read and the credibility around it, but how is an old map read? Scientific sources are often about how what was once seen as a fabrication later became a truth. Mathematical sources are often about reading statistics. How do I read into/from this? Am I looking for an expected answer? If so, maybe I'm reading the statistics incorrectly? Historical sources are also included in this chapter as it can be even more difficult to assess authenticity when the source is a few years old. This section suggests how you can work with different sources in the classroom in different subjects.

Historical Sources

How can we understand what it was like to be Jewish during the Second World War? How can we understand what it was like to be a woman in Sweden in the eighteenth century? Children in the seventeenth century? Emigrants? Immigrants? You can work on this by using the original sources that still exist, thanks to the National Archives where you can find original documents from the Middle Ages.

There are extracts from church books, court books, prison rolls, maps, medieval parchment covers, medieval letters and paintings.

Continue to work with students on source criticism of historical images. Did the images tell the truth or more about how it should be interpreted? Were people critical of sources during the French Revolution, for example? Produce a series of historical images and let students interpret these and then see what the purpose of the illustration was.

Lesson Ideas—Historical Sources

One way of exploring and approaching historical sources can be to work with so-called "storylines" where learning takes place within the plot of a historical story.

Ages 6 to 12 Working with Historical Sources

Imagine that the students enter the classroom and there is a very old (invented) letter written by an emigrant in the nineteenth century, Nils Eriksson. Tell the students that the letter was left by a woman who works at the City Museum in Gothenburg. In the letter, Nils talks about his upbringing in Sweden, his family circumstances and his journey to America. Read the letter to the students and then you can formulate a response. Ask the students how they think the letter came to their particular school and why. Try to find out facts about what it was like to emigrate from Sweden in the nineteenth century and why so many people did so. How do we know that the information we find is true? The letter is suitable to work with from Year 4 upwards but advance or simplify the task depending on maturity and age. As you look for information together, you as the teacher will have a discussion about the choice of sources at all times. Challenge the students and let them come up with their own sources. By using different types of sources as a teacher, pupils can get to know their history. As a conclusion, you can have an exhibition with the students' questions to Nils and the answers Nils gave.

Ages 13 to 18 Working with Historical Sources

One way to work with historical sources is to look at how child labour was portrayed during industrialisation. For example, Petra Johansson, a librarian at Vägga Upper Secondary School, completed an assignment that includes different types of historical sources: an interview from the mid-nineteenth century, a narrative source from the early twentieth century and a modern one about a factory in Bangladesh.[7] Comparing these three sources using the concepts of authenticity, proximity, tendency and dependence/independence is a way of working critically with historical sources.

Some historical sources are "born" digitally, while others are digitised and instead start from a physical source that has been transformed into something we can find on the internet. At secondary school level, students can be asked to analyse source material based on the basic principles of authenticity, proximity, dependence and tendency. Annika Sjödahl, the National Association of Teachers' subject expert, suggests that you as a teacher can work on this as a group assignment where all pupils are given a given extract that can be discussed according to the basic principles above. Together, the pupils can then come up with a question they want answered, such as how women have been portrayed in the media over time. Then it's time to search for information as well as sift through the material they find, comparing and selecting sources. Following this, students can

[7] https://www.google.se/policies/faq/.

summarise the facts by organising the information. Start with the question that was to be answered and the purpose of why that particular question was chosen. Remind students to be objective while writing and remove anything that is personal opinion. As a teacher, you can go through examples of citation markers with your students so that they are always accurately reproducing what someone else has written. They should also use the Harvard system when referencing (see the chapter "Referencing—Plagiarism," p. 122). The last part of the task is a reasoning post and here you work in the same way as in the chapter "Making critical reasoning about sources" (p. 113). Students can then summarise their conclusions and write a list of sources.

As a teacher, you can also allow older students to relate source criticism to something close to them and/or self-experienced. This could be a role-play in the form of a student council meeting where students should come up with solutions and decisions and then write this down in a well-written protocol. What is then not visible is the relationship between their own thoughts and experiences and the written minutes left behind.

Mathematical Sources

For mathematical sources, you can also work with storylines to create conditions for learning within the context of a story.

Lesson Ideas—Mathematical Sources

Below I give an example of how you can work with mathematical sources in the context of the Pythagorean Theorem.

Ages 13 to 18 Working with Mathematical Sources

Your name is Pythagoras and you have a very good idea, so you write a letter to a class. Let them find out what you came up with. Did you really come up with it? How did you come up with it? Use statistics that students can read and analyse. Are the students saying what you want them to say? How can we trust it? Then have students do their own surveys and compile the information and present it to each other. Let the listeners ask didactic questions about the work.

Search Engine Optimisation

Why is it important to include search engine optimisation, SEO (Search Engine Optimisation), in a book about source criticism? Search engines influence the results that appear when we search on Google, for example. Search engine optimisation is about getting high on Google's hit list and in this part you will learn how search engines sort. Money can control internet navigation, but how? Googling your way to a truth becomes paradoxical. Is it possible that the URL says something about the credibility of the source? Is it possible to tell who is behind the

source and whether that person is an expert in the field? What does a website's "About" button say? What is a top-level domain and what does it have to do with source criticism?

What is Search Engine Optimisation?

The highest ranked result in a search is not always the most relevant. Let's say you're looking for a vacuum cleaner, you google and the results at the top can vary in how relevant they are to your purpose, namely to be able to buy a new vacuum cleaner. Some sites write about vacuum cleaners but don't sell any, so you look further down the list and find one that looks appropriate, click on it and find what you're looking for. You look around for a long time and this is stored in your computer's memory, called the "rankbrain," which is determined by how long you have been visiting the site. In addition to this example, there are nearly a hundred other factors that influence which hits appear at the top of Google. When searching for a product, a service or an article, you should be source-critical about hits. There are many companies today that help other entrepreneurs to get to the top of Google, for example, based on their desired keywords. On the one hand, there is the so-called organic search field, i.e. positions 1–10, and on the other hand there are the purchased ads, which are usually at the top of the blue highlighted area and on the right-hand side of the organic field. The bought ads (also called PPC, pay per click) do not have to take you to what you searched for but are usually used by companies who want to get traffic to their site/web shop. Search engine optimisation is about getting to the top of Google for searches because it is simply profitable—so ultimately search engine optimisation is about money.

From Google's perspective, search engine optimisation means making pages better for visitors, because Google wants to be able to deliver the best search result for each query. Wikipedia, for example, often ranks high, even though it doesn't make much money. However, they have good content and a good reputation (see more on this in the chapter "Wikipedia as a source of information," p. 143). It is Google itself that, through algorithms, decides what comes top on Google. You cannot buy your way to the top of Google (apart from the ads). A search result can be tailored to you and thus search engines are not neutral. This means that you and I may get different results depending on what we have searched for before.

Search engine optimisation is about the fact that there are really two main parts to a website: the content and the reputation of the site. Website content is what is actually on the page. This should correspond to a visitor's search intent, i.e. if I search for camel tours in Western Sahara, pages that are most relevant to the search term should come up at the top. Technically, I recommend Google's own manual on search engine optimisation. If several pages have similar content, an important parameter is instead the reputation of the website. Reputation is created through links, and these links are valued differently depending on the source, target and so-called anchor text. For example, a link from a major newspaper is worth far more than a link from Kalle's home carpentry. A simple method of assessing link

value is whether the reader is likely to click on the link. For example, a link to a mobile phone subscriptions page from an article in a major newspaper about new mobile phone subscriptions is worth more than a link to gold jewellery in an article about boat engines. There are many attributes that influence a page's position in the search results, but the above two, content and reputation, are the most important. There are many search terms that are profitable in different ways, and search engine optimisation itself is all about being in the spotlight of searches.

Say a company tops the search list for "car mechanic" which can be profitable as it increases the likelihood of customers contacting this shop. That the garage at the top is also the best may not necessarily be the case, but that does not mean that it is the worst. The most optimised keywords are also the most competitive, such as "hotel," "catering," and "casino." For companies using these, getting high in the search list is more of an achievement as there is probably a lot of hard work behind it or the company/service has been established for a long time. A comparison site between different web hosts can be profitable, because a visitor can go on and buy a web host from one of the ones linked to. Comparison sites are a typical example of a site to be source-critical of, as they sell by commission (affiliate networks). It is quite possible that they simply recommend the hosting provider that gives them the most return. The whole page appears as one big advertisement. It's more often about the individual page than about search engine optimisation per se.

However, it's not just search engines that filter our results, but also Facebook and other digital media. They filter and categorise—all because of algorithms: "Algorithms are usually part of software and consist of instructions on what to do, with what and in what order."[8] Algorithms, then, are what your digital tool uses to decide things, such as your search for diet pills suddenly generating ads on your Facebook account or in your Instagram feed.

The main reason is that we now encounter information in different channels in such large quantities that human handling alone is virtually impossible. For example, how could we manage the hundreds of thousands of hits that online searches produce if we were not helped to prioritise the results? We see this sorting when social networking services create a feed of content, when search engines rank web pages and when different sites recommend everything from movies and music to dinner recipes for the individual user.[9]

Lesson Tips—Search Engine Optimisation

Here, teachers can get lesson tips on how search engines sort and how to lead the reader to specific information.

Ages 6 to 12 Search Engine Optimisation

Talk to students about what a search engine is and how a smart search can be carried out. Talk about how they google, what hits they choose and then briefly

[8] https://www.iis.se/docs/Algoritmer.pdf.
[9] https://www.iis.se/docs/Algoritmer.pdf.

introduce what SEO is and how it works. Also talk about algorithms and how some things can spread very quickly. If you like, show a film clip of what this might look like. Students need to get a feel for how much information and other things are spread and how quickly.

Ages 13 to 18 Search Engine Optimisation

For the older students, it is possible to get more technical about how SEO works. Let the students think about the situations in which they feel that advertising or topics they have searched for might be targeted at them. On these occasions, pupils have been allowed to use mobile phones and school computers during the lesson and then go onto the social media sites they may be using, others have been allowed to play computer games where they receive adverts. The aim has been to write the advertising on a whiteboard in the classroom and we often fill a whole one with examples. Based on what we see, we discuss it in more detail and try to categorise different areas and rank which group of advertising dominates. For Year 9 pupils, it has been high schools that dominate, but games and accessories also get a lot of space. Also ask if they find a google search a time saver.

An algorithm is what the user is expected to see, but we risk getting a one-sided information supply. We are influenced when we don't know we are being influenced and algorithms are influenced by past behaviour. Algorithms work on a need to buy but also on an opinion. Google diet cure or diet pills and map out the coming week's ads on Facebook, for example. Have students use their social media accounts to see if they can find any connections and use large blank sheets where students can draw parallels between searches and "suggestions" that keep popping up very appropriately. I did this exercise with Year 7 pupils and they filled a whole board with adverts that pop up in their social media feeds or in computer games. Can students create their own algorithms?

Top Level Domain

A website's "About" button tells you something about the background and purpose of the page, it's usually where you'll find contact details and more, while a URL tells you something about where the source comes from. A top level domain (TLD) is the last letters of a website, for example org, no, se, nu, gov or uk. However, there are sites that have trustworthy names in their URL but can still be fake, for example when it's .co after .com it's time to be a little more careful. These are often internet sites whose names are very similar to something else in order to increase credibility but are instead used as a so-called "piggyback ride." This means that people want to ride on another website's trustworthiness (Strachal & Thurén, 2011, p. 27).

Wikipedia has listed top-level domains and has comments on some of these[10]. It is mentioned that.co is a variant of .com and is used by site owners (see the example above with the addition of .co after .com). For member countries of the European Union, the .eu TLD can be provided, but the most common TLDs are country code Top Level Domains (ccTLDs). Top level domains such as .mu and .me (music and me) are also commonly used but the origin was .mu for Mauritius and .me for Montenegro. In some countries.nu is popular, including Sweden, Denmark and the Netherlands, as the TLD also has a linguistic meaning. However, the TLD belongs to the island of Niue in the Pacific Ocean, just as .no is a national TLD for Norway. A TLD used mainly by federal and state governments in the US is .us, but this is changing and more and more companies are now also using this TLD. Other common domains in the US are .com .org .net and—often at universities—.edu (education). The .gov TLD is reserved for the US government and .edu is reserved for education. For non-profit organisations.org is reserved.

Lesson Tips—Top Level Domains

Below are lesson tips on how to display the "About" button and what it often provides more information about.

Ages 6 to 12 "About" Button

Together with younger students, you can go to different websites, click on the "About" button and discuss what it says about the site and its information. With older pupils, you can work more on source-critical issues and let pupils compare the "About" buttons on different websites. Is there always such a button? Why might it be missing? If so, what does it say about the content and purpose of the page?

Ages 13 to 18 "About" Button

There is a public directory, who is .com, where you can see who is responsible for a domain or IP address.[11] Introduce the directory to the students and discuss the purpose for which it can be used.

Social Media

It's hard to write a book about source criticism and skip over social media and how it affects us. As far as social media is concerned, as a teacher you can talk about discussion forums, posts, comments and general behaviour on the internet. Why is it that it is easier to write a comment than to say it? The language of adults differs from that of young people, but in what way? Who shares the most online?

[10] https://sv.wikipedia.org/wiki/Toppdomän.
[11] https://www.whois.com/whois/.

What are defamation, insult and abuse? Are they punishable? Which forums are appropriate to post on? Concepts such as privacy also fall under this heading.

Social media can be divided into two parts—"safe online" and "social communication." Social media involves immense sharing, which in turn can lead to a challenge in source criticism. Social media acts as a communication channel and if someone does something bad in this channel it is communicated, which can happen quickly. Discussing and working with social media in school also includes giving students the tools to avoid spreading inaccuracies.

New Situations Require New Conversations

A newspaper operates on the basis of the Freedom of the Press Act, i.e. the right to express oneself in printed media. A newspaper always has a responsible editor who is legally responsible for what is printed in the newspaper or on the website, from advertisements to articles. For social media, such as Facebook, there is no responsible editor. There can be a danger of newspapers leaving their comment fields completely open. By having open comment fields, there may be people who have a need to write and who use the comment fields for just that purpose. What may then appear in the comment fields may need to be discussed with the students. From my experience, one school had a Facebook page where parents wrote off, sometimes in very unkind language, about both pupils and teachers. This group was closed down. In another case, there was a school whose website had an open comment section where the public could go in and write, which also had to be removed.

Parents, and adults in schools, need to decide that new situations online also require new conversations. Talk to children and young people about what is happening online, how they behave online, what they read online, what they see online and more. These are conversations that need to happen on an ongoing basis, not just once. According to Elza Dunkel's (2007) research on what children and young people do online, it has been found that they are often left alone and have to find their own solutions on how to use the internet. The issue of anonymity is often the one that parents tend to be harsh about, "never give out your name," which in turn, according to Dunkel (2007), helps young people to be anonymous online. However, anonymity can help people take the opportunity to say things that would not otherwise be uttered—I am still anonymous. Safe use is about getting children to talk about what is happening online. Some things that develop in social media become terrifying for us adults (Periscope for example) and we create bans. These bans in turn create insecurity in children and a feeling that they may not want to talk about what they are doing online anyway. The result is that we leave children alone.

Digitisation is happening fast and new things are coming out all the time that students are taking up. Adults should always make sure that they are able to have a discussion with young people and that they keep up to date. What should be central is where young people are online and the focus on strategies. We also need

to discuss strategies for meeting IRL ("in real life"). If there are strategies, there can also be good meetings, according to Löfving (2013). A guideline I personally use, and which I tell my students, is that if I cannot say something directly to the person it concerns, I should not write it about that person online either.

Safe Online and Social Communication

"Whoever designates someone as criminal … is sentenced to a fine for slander…".[12] Defamation is not in itself a crime but falls under Chapter 5, Sect. 1 of the Criminal Code. There are various cases that can be discussed with students (Dahlström et al., 2011). There are two different defamation offences: slander and insult. Defamation (attack on honour, the objective honour) is, for example, when a local celebrity is attacked because another person writes that he or she is a Nazi. It is slander, it does not matter if it is true or false. Such a rumour must not be spread, but for it to be classified as defamation it must have been spread on a larger scale. Another example might be a person who is a member of a closed, free church congregation. If things are spread about this person, things that are offensive to the person, it may result in the person being excluded from the fellowship of the congregation. That would be an example of defamation as it becomes more widespread, at least within the church community. With students, the focus does not need to be on what is the punishment itself but on what is ethically justifiable. Instead, have a discussion about what in the Penal Code actually includes common trash talk and gossip.

In the case of insults, there is a line between the interest of freedom of expression and what is ethically justifiable, where there must be an acceptance of freedom of expression that should be complete and valid. This, in turn, means that famous people have to endure more. Illegal threats and offensive photography are often difficult cases to prove; even if an IP address is available, it is always difficult to know who is sitting in front of the computer.

Other terms that are common when we talk about online and social media security are grooming and catfishing. Grooming refers to perpetrators who prey on children in order to get them to participate in sexual acts, while catfishing is when someone pretends to be someone they are not. Catfishing is also used when someone takes someone else's identity and, for example, makes a fake profile on Facebook. The concept of social communication can in turn be divided into three different types, depending on the medium used. Firstly, there are communities, including Facebook, then there are micro-blogs such as Twitter and finally there are online forums such as Flashback.

[12] From *Crimes and penalties - a textbook in criminal law on the criminal code* (4th ed.), by Dahlström et al. (2011), Bruuns bokförlag.

Lesson Tips—Safe Online and Social Communication

Here are some tips on how to discuss who students are online and whether this differs from who they are in real life.

Ages 6 to 12 Safe Online

The concept of online safety includes questions such as "Who am I online?" and "Who else am I?" With this audience, the discussion may be about "a photo taken for fun" and a fictional story about an experience with a likely high recognition factor. It is also possible to do some work with questionnaires, where you as a teacher prepare a series of questions about young people's online habits, and then compile the results and use them as a basis for discussion with the pupils. Then let the pupils google themselves to deepen the discussion about what has been published. Talk about risks and strategies for online safety and give students some clever tips. Also train them to be critical of sources on YouTube.

Ages 13 to 18 Safe Online

This is partly about starting a discussion about online safety and partly about giving students strategies for feeling safer online. By talking about digital identity with older students, the discussion can lead further into who we are presenting to. Digital identity is based on the fact that we often disclose information about ourselves online that we would never do verbally. For example, there is a commercial in which a man stands in a square and shouts personal details about himself into a megaphone, something very few of us would likely do. But many of us do it, in some form, on the internet. Discuss with students how public the internet is and whether there is anything that can be categorised as "safe online."

Grooming can also be discussed in terms of risks and strategies. Pupils can make their own information video on, for example, the concepts of "grooming" and "phishing." Let students tell you if they chat and if so whether they have any ways of getting information about the person on the other side of the screen. In my experience, students are extremely quick to ask control questions to determine some sort of age range of the person they are chatting with. With older students, it is possible to discuss some cases where students have hung each other out on social media and charges have been brought. When a conflict happens online—should I take sides? How can I stop it spreading? Talk about the consequences of their own actions and let students share anonymously, situations they have experienced on social media.

Ages 6 to 12 Social Communication

For example, you could have a friends and superheroes theme and have a discussion about where students are online. Often students are in chats that are gaming related, someone might be using apps such as Kik, Instagram and/or YouTube. By having a comparable system, you can discuss the difference between the written and the spoken word. Have students think individually "What is the difference if I say you are stupid or if I write it?" At this point, it is useful to have students think about the questions one by one before the discussion becomes a whole class

discussion, or smaller group discussions. In my experience, the discussion will be better and more people will have their say if students are allowed to prepare first. The aim is that students should become aware of the difference between writing something and saying it in real life, face to face. You can have students write down something mean that they have been exposed to on social media, or something they have written to another person. Have students turn around and say it to someone else. Why is this more difficult than writing it? It hurts just as much. Have a discussion with the students about what can they learn from this. Take an inventory of the social media the children use. Then let them work out discussion questions based on ethics and morality which in turn can lead to social rules, i.e. rules on how to behave online.

You could also do longer pieces of work on what a good online friend should be and have students present this to other classes in the school. Even if we don't always live as we learn on the internet, students still get a foundation of what is good behaviour. Talking about social virtual competence is a must in the world of school. When the Periscope app, a live video application for mobile phones in particular, reached its peak, many students used it in the school world to incite each other to do things they could not really stand for. The benefits of Periscope became somewhat overshadowed. Prepare discussion questions for students to answer individually about how to be good online:

What exactly is a violation—and who can say they have been violated?
What to do if a violation occurs?
What can individuals do if they read something offensive about someone else?
What happens if a student ends up on an adult site?
What should a student consider when blogging?
How can your images be used in 30 years and can you stand by them then?
What do I do if someone steals my identity?
How are webcams and chats used?
What can I do to feel safe?
Take a screenshot of offensive comments in a forum and discuss how to behave.
Talk about passwords.

In terms of social communication and younger children, the discussion can be taken further on media habits, on what "viral" means and some network ethics. Talk about games, for example "Movie Star Planet" which is not only a game but also a forum for writing comments about each other. Talk about social media and screen time and, with older pupils, who they communicate with. Talk about advertising in net ethics; with older pupils it is possible to discuss blogs in terms of net ethics as well as "levelling" source criticism and discussing biased voices and net trolls. Talk to pupils about a democratic approach, the basis of the school's values. Focus on identity-integrity, social intelligence/communication, interacting in networks, strategies, entrepreneurship, media society-jobs and leisure and what can generate opportunities for "inside."

It is also possible to make a question box where you have the opportunity to start from the students' reality and what they are experiencing. In a question box, many anonymous and important points can come up for discussion on the topic of social media. Then have discussions with the pupils, without intimidation. After all, you are an adult with life experience who can guide students in the right direction (Löfving, 2013, p. 131).

Ages 13 to 18 Social Communication

Address events that older students can relate to, for example, the so-called "Clown Attack" was big in 2016. It was reported that costumed clowns were scaring people and this created some fear in children and young people. The events were a good forum for discussion about the spread of social media and what it does to us.

Work a lot with Facebook groups and use a range of predetermined and more exploratory questions. These could be "Who is the administrator of the group?", "What is the purpose of the group?", "What is the climate of the comments section?", "Who are the members of the group?", "Is it open or closed?" etc. What students learn here is to instil a source-critical approach to social media. You could also investigate certain YouTubers and YouTuber clips, where you find out as many facts as possible together and then have the students ask themselves a series of questions to get closer to the purpose for which the clip is posted. On quick social media sites, such as Snapchat, you as a teacher can create groups to see how students are behaving, then use that as a basis for discussion.

Train students to leave comments in comment fields and forums, for example by having students, digitally, provide peer feedback on each other's texts. Everyone can read everything everyone writes, including the teacher. Look at existing forums, such as Flashback. On the one hand, there are newspapers that don't want to hang people out to dry; on the other, Flashback acts as an extension of journalism. On such a forum one can speculate freely and spread untruths and truths, truths can also hurt quite a lot. How does your Facebook page work in terms of news and forums where the public can comment on what is happening? Link the task to the example I gave earlier about open comment fields. Do students manage their own Facebook pages? What do they do about nasty comments and others that hang people out to dry? This is well worth discussing with students.

Flashback is something the students are probably well aware of, and you can let them find out what rules Flashback has for those who post in the discussion threads—but also what the rules are for Flashback itself. Have students think about whether there are any advantages/disadvantages to this type of discussion forum. What possibilities are there with the anonymity that comes with this type of discussion forum? What advantages/disadvantages might the anonymity itself bring? For example, have students look up information about "known Swedish drunk driver" or whatever to see the jargon on the forum. As a teacher, however, you should have made this clear beforehand. Let the students use Flashback as they would Google, i.e. as an information channel. Then remind them of the questions raised in the chapter on 'Reasoning from sources' (p. 113) and let them work through the questions one by one and then present their findings to a peer, in a group or as a whole class.

On Facebook, students can look at fake accounts, such as accounts where a person is pretending to be someone else. It can also be a so-called fan page. The task can take different forms but, for example, you could ask students to look for an official page of a famous person or organisation. In some cases, the hits may contain a clear statement about the person or organisation in question ("Alice Bah for president"), while in other cases it may be more difficult, for example if there are five "Alice Bah" accounts. How do I know which one is the real one? Does she even have Facebook?

Students can also find out more facts about the different groups that exist on Facebook and investigate them more thoroughly. Give students some questions to consider:

What is the purpose of the group? Is it to inform or to entertain?
Is there any reason why you should be in this group?
Can you extract any information about the group?
Does it seem that the group wants to spread a specific message in some way, and if so, what is it?
If you look at the comments, are they meant to amuse or can they also hurt people?

Let students do their own research on what is most shared on social media and let them categorise what they find. They can do the research in their own circle of friends and look at the following questions, for example: what do their friends share? Does it differ between girls and boys? Is it sports, politics and accidents/crimes or even culture and fun that are shared the most?

Final Words

After going through the lesson plans I highlight in this book, students will have enough to demonstrate their source-critical skills by working critically on a major research task. Therefore, I want to give you one last tip, a task that is appropriate for most students in grades 4 and up.

Research Assignment in the Form of Project Work

Choose a topic to research, it can be almost anything but there should be no simple and short answer other than speculation. Students should choose an area of research themselves and then think about what they already know about the topic they have chosen. Students go on to describe the purpose of their research and their research questions: what do I want to know? How can I go about finding this out? Does it require an interview? When will the work be finished? Experientially, this has been a successful task when students have chosen fairly broad questions such as "Spirits—do they exist?" or "When can we cure cancer?" In these cases,

it has been difficult for students to find a truth and instead the work during the research itself has been a learning process. Those students who chose questions such as "How can I become a veterinarian?" and thus had a fairly short research path with a clear answer have not learned as much during the process. It is therefore important that you as a teacher decide which research questions are worth working on. As this is a project, it also requires a bit more time and commitment. The structure could look like this:

Choose your area of research (here it may be useful to let students use mind maps as a tool to frame their area).
Do you already know something about the subject? Write it down before you start looking for new information.
What research questions do you have? What do you want to achieve with your work (during this point, the teacher must challenge the student and ensure that the research question is complex enough to research further)?
How will you find out the information? What kind of sources can you use?
What are your deadlines and when is the work expected to be completed?
Make sure you know how to cite sources as you work.
Now you can start writing.
After a few lessons, you will need to check with your teacher whether it is possible to carry out your investigation. Are your questions clear?
At the end of your work, you should include a heading about source criticism, where you can describe which sources you have chosen/selected out and discuss how you have thought.
Source criticism is not something we can work on once and then never again, it is something we have to work on continuously. Source criticism should rather be an approach and not a subject in itself. See this book as a tool along the way in working with source criticism in school and learn to relate to what you see, hear and read. Think about what you believe—and why. Be self-critical, i.e. critical of yourself.

References

Creative Commons. (n.d.). http://www.creativecommons.se/om-cc/licenserna/

Dahlström, M., Strand, A., & Westerlund, G. (2011). *Crime and impact - a textbook on crime law* (4 ed.). Bruuns bokförlag.

DN: Ledare (2017–03–13). *Are you critical of sources, little friend?* http://www.dn.se/arkiv/ledare/are-you-cold-critical-little-van/

Dunkel, E. (2007). *Bridging the distance: children's strategies on the internet.* Doctoral dissertation. Umeå University.

Education Committee. (2016). *Digitalisation in schools - its impact on quality, equity and outcomes in education.* https://www.riksdagen.se/sv/dokument-lagar/dokument/rapportfran-riksdagen/digitaliseringen-i-skolan---dess-paverkan-paH30WRFR18/html

Expo Foundation. (2017). *Using myths as weapons - a handbook on conspiracy theories and how to deal with them in schools.*

Google's Search Engine Optimization Handbook. (n.d.). http://static.googleusercontent.com/media/www.google.se/sv/se/intl/sv/webmasters/docs/search-engine-optimization-starter-guide-sv.pdf

Löfving, C. (2013). *Digital tools and social media in education - how to create a relevant school out of lgr11*. Liber.

Mosesson, M. (2017–02–16). *Fekknowledge spreads from "trollfabrik" in Macedonia.* https://www.dn.se/nyheter/sverige/fejknyhetersprids-fran-trollfabrik-i-makedonien/

Regeringskansliet (2017–03–09). *Strengthened digital competence in schools governing document*. http://www.regeringen.se/493c41/contentassets/acd9a3987a8e4619bd6ed95c26ada236/informationsmaterialstarkt-digital-kompetens-i-skolans-styrdocument.pdf

SFS Swedish Statutory Instruments 1998:204.

Sjödahl, A. (2016–02–11). *A writing template and support structure for critical thinking.* http://lrbloggar.se/annikasjodahl/en-skrivmall-och-en-stodstruktur-for-kallkritiskt-resonemang/

Skolverket. (revised 2017). *Syllabus for primary school, pre-school and leisure home 2011.*

Strachal, G., & Thurén, T. (2011). *Source internet: assessing information using source-critical principles.* Gleerups.

Swedish Radio. *Conspiracy theories: source criticism, facts and lies on the Internet.* http://sverigesradio.se/sida/section/846451?programid=503

Sydsvenskan. (2014–08–03). "Wikipedians are becoming more common." https://www.sydsvenskan.se/2014-08-03/wikipedianer-blir-alltvanligare

Wikipedia. (n.d.). https://sv.wikipedia.org/wiki/Grebbestad